5G Innovation Regions Programme Interim Evaluation

Interim process and impact evaluation report

December 2025

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Glossary

Table 1: Abbreviations

Key term	Definition
5GIR	5G Innovation Regions
CA	Contribution Analysis
DSIT	Department for Science, Innovation and Technology
IoT	IoT stands for Internet of Things and refers to the collective network of connected devices (or 'things') usually embedded with sensors, software and/or other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet
LA	Local Authority
LoRaWAN	LoRaWAN stands for Long Range Wide Area Network. It is a low-power wide-area network (LPWAN) protocol designed for long-range communication with low power consumption, making it suitable for Internet of Things (IoT) devices
MNO	Mobile Network Operator
UKTIN	UK Telecoms Innovation Network

Table 2: Glossary

Key term	Definition
Activities	The material and human resources used to undertake the tasks which underpin an intervention
Benefits	Positive outputs and outcomes (including economic, social, and environmental) resulting from an individual 5GIR use case or project
Impact	The changes which result from the outputs and outcomes from an intervention over the short, medium and longer term and that would not have happened otherwise
Intervention area	Area that received funding from DSIT for the 5GIR intervention
Network/tech provider	Providers of telecoms networks and connectivity services (including MNOs)
Outcomes	The changes which result from the intervention outputs over the short and medium term
Outputs	The deliverables that directly result from the inputs and activities related to an intervention

Stackable use cases	The provision, or layering, of multiple use cases that can be served by a common connectivity solution
Steering Group	The Steering Group for the evaluation has the role of providing advice, guidance, scrutiny and challenge to the evaluation. It consists of DSIT officials and a member of the Cabinet Office's Evaluation Taskforce
Theory of Change (ToC)	A theory of change describes and illustrates the changes an intervention is seeking to make, how it is expected to happen, and the measurable outputs, outcomes and impacts associated with the intended change
Use case stakeholders	Providers, users and procurers of advanced connectivity use cases and associated technologies/solutions. The use cases can span many sectors and purposes

Executive summary

Introduction

To support the Department for Science, Innovation and Technology's (DSIT) ambition to deliver world-class digital infrastructure across the UK, drive innovation and unlock opportunities for economic growth, DSIT established the 5G Innovation Regions (5GIR) programme.

The 5GIR programme aims to drive innovative applications powered by 5G from proof of concept to widespread adoption. Innovation Regions aim to demonstrate and adopt 5G and other advanced wireless use cases across key sectors of the economy. Each Innovation Region plans to demonstrate the scalability, replicability, and sustainability of use cases, and disseminate project learnings and benefits.

The 5GIR programme delivery commenced in November 2023 and was originally planned to run until March 2025. In late 2024, DSIT extended the 5GIR programme for 12 months through to March 2026 to give projects more time to realise the benefits from their use cases.

DSIT commissioned KPMG to evaluate the 5GIR programme[1] and following the extension, it was agreed with DSIT that an interim process and impact evaluation would be conducted. As an interim evaluation, this report does not attempt to provide a final view on the overall impact of the 5GIR programme, but provides an assessment of how projects are progressing towards the delivery of the intended outcomes as at the end of March 2025.

The evaluation seeks to answer the following two overarching evaluation research questions:

- Process evaluation: What went well and what could be improved with regard to the 5GIR programme, specifically in relation to the design and delivery (from both a DSIT and local authority (LA)/partner organisation[2] perspective)?
- Impact evaluation: To what extent did the 5GIR programme achieve the outcomes it set out to achieve within the timescale of the evaluation and to what extent can these outcomes be attributed to the programme?

More detail on these research questions, what they cover and how this interim evaluation seeks to answer them is set out in Section 2.

Interim process and impact evaluation methodology

The approach taken to delivering the interim process and impact evaluation aligns with that set out in the scoping and baseline report[3] as well as the principles of the

[1] KPMG, 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report, May 2024
[2] Where partner organisation refers to other stakeholders involved in the delivery of 5GIR interventions
[3] KPMG, 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report, May 2024

HM Treasury Magenta Book. It also reflects the fact that many of the outcomes and ultimate impacts expected from the 5GIR programme will take time to materialise and had not been delivered at the time of this evaluation.

A range of research and data collection methods have been employed to obtain the evidence needed to answer the research questions. The main sources of data and information used include: programme documentation (e.g benefits trackers[4] and sector deployment reports[5]); interviews with 5GIR project leads, DSIT officials and officials from the UK Telecoms Innovation Network (UKTIN); and surveys of other stakeholders involved in the 5GIR projects (network providers and use case stakeholders).

Interim process evaluation

For the interim process evaluation, thematic analysis is conducted on the evidence outlined above to identify key themes and insights. An assessment is made of how the processes and approaches adopted for the 5GIR programme have affected the delivery of the programme through to the end of March 2025. Any lessons that can be learnt from the delivery of the programme for future programme delivery for instance are also outlined.

Interim impact evaluation

The purpose of the interim impact evaluation is to assess what changes have occurred up to the end of March 2025 as a result of the 5GIR programme and the extent to which such changes can be attributed to the programme itself.

To answer the overarching research question and assess the impact of the programme, in the absence of viable quasi-experimental methods[6] a theory-based approach to the 5GIR interim impact evaluation using the HMT Magenta Book is applied. Theory-based impact evaluations draw conclusions about an intervention's impact through rigorous testing of whether the causal chains thought to bring about change are supported by sufficiently strong evidence and alternative explanations can be ruled out.

A Theory of Change (ToC) describes and illustrates the changes an intervention is seeking to make, how it is expected to happen, and the measurable outputs, outcomes and impacts associated with the intended change. At a broad level, the ToC for the 5GIR programme (see Figure 2.1 in Section 2 for more detail) assumed that using the funding provided, a number of stackable use cases would be delivered by 5GIR areas. 5GIR areas were expected to share knowledge and lessons learnt from the delivery of the use cases across their area and outside the intervention area. This activity was expected to lead to a general increase in demand for 5G and other advanced wireless technologies, increasing commercial investment in advanced connectivity networks and services and resulting in increased economic

[4] The benefits tracker was a spreadsheet used to track progress against each project's intended benefits.
[5] Sector deployment reports were produced to capture the learnings from each 5GIR project.
[6] 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report, May 2024

growth. The 5GIR programme also aimed to increase collaboration among partners in the delivery of projects such that a 5G ecosystem was developed.

In line with the approach set out in the scoping report, the theory-based approach of contribution analysis[7] (CA) is applied to assess the extent to which the activities undertaken by 5GIR areas have been implemented in accordance with the ToC. It is used to test the extent to which the chains of causality, and underlying assumptions, in the ToC are supported by and confirmed by the evidence available. However, based on the evidence available and the change that is currently visible, it is too early to apply fully a CA framework in this evaluation because outputs and outcomes are still emerging and/or uncertain. As a result, in what follows, initial thinking around the contribution story and a preliminary narrative of how the programme is contributing to change is presented. To that end, the evaluation assesses the extent to which the activities undertaken by 5GIR areas up to the end of March 2025 are consistent with the future delivery of expected outcomes and impacts as illustrated in the ToC.

Caveats and limitations

When interpreting the findings of this interim evaluation there are a number of caveats and limitations to be aware of. In summary these include:

- At the end of March 2025, many of the use cases had been operational for a relatively short amount of time and some had yet to be implemented. This means that, as at the end March 2025, many benefits were yet to be realised, documented and/or disseminated. As a result, the evaluation does not capture the full impacts of the programme.
- Much of the evidence for the interim evaluation has been drawn from interviews and surveys with programme stakeholders. Contact details for these stakeholders were provided by 5GIR areas. There is a risk, therefore, that the selection of stakeholders and the information provided by them may contain bias. To mitigate the impact of this, information and data drawn from stakeholders has been reviewed against other sources for consistency.
- The quantitative recording of project-level benefits has been undertaken by each 5GIR area individually. This creates a risk of inconsistency in reporting across 5GIR areas (as well as between 5GIR projects within individual areas). Whilst steps have been taken to minimise this risk, this evaluation is reliant on the accuracy and completeness of data provided.

Key findings

Summary of the interim 5GIR process evaluation findings

The overarching research question for the process evaluation is: **What went well and what could be improved with regard to the 5GIR programme, specifically in relation to the design and delivery (from both a DSIT and local authority (LA)/partner organisation perspective)?**

[7] Contribution analysis is considered the most appropriate theory-based approach to apply to this evaluation because of the ability to use the range of evidence and information to test and, where relevant, attribute causality to linkages in the ToC.

To help answer this overarching research question a number of supplementary process evaluation research questions were developed. This section considers the main topics that came through from the thematic analysis of the supplementary questions which included: the outputs achieved through the programme; factors affecting delivery (at the programme and project level) including the funding method used for the programme; and improvements that could be made to the programme.

The evidence identified the following key findings:

A large number of advanced wireless technology use cases were implemented in the period to March 2025:

- By March 2025, 119 use cases had been implemented across 5GIR projects – over 80% of 5GIR areas' original plans for at least 144 use cases. Use cases using existing connectivity solutions (e.g. public mobile networks or private wifi networks) tended to be deployed earlier than those use cases requiring the provision of a private 5G network. By March 2025, two 5GIR areas had not implemented use cases; both projects involved the procurement of private 5G networks.
- Examples of the sectors and use cases covered by 5GIR projects include:
  - Agriculture – with use cases including sensors measuring temperature, humidity, rainfall to maximise crop growth
  - Manufacturing – with use cases involving remote monitoring, predictive maintenance, and real-time data analytics
  - Aerospace and engineering – with use cases including improving training and operational efficiency through the use of extended reality (XR) technologies
  - Social care – with use cases including Technology Enabled Care (TEC) using devices like smart speakers, sensors, doorbells, bed mats and smart watches
  - Social housing – with use cases including sensors measuring temperature and humidity to help avoid the build-up of mould
  - Ports – with use cases including sensors to support transport logistics and the efficient operation of port facilities
- Therefore, 5GIR projects had implemented, or were in the process of implementing, use cases testing the value of advanced connectivity networks and services in line with the original objectives of the programme by the end of March 2025.
- Just over 250 dissemination events sharing knowledge and findings from individual 5GIR projects had been delivered by March 2025. However, the majority of this dissemination was attributable to two 5GIR areas and occurred within the individual 5GIR area (rather than with organisations outside the area).

There were various factors that supported the delivery of the programme:

- DSIT's support, particularly technical support, was cited as being important in the successful implementation of use cases for 5GIR projects.

- The funding method used for the 5GIR programme[8] was reported to have had a positive influence on the delivery of individual projects and of the programme as a whole. Specifically:
  - Incorporating the funding method into the design of the 5GIR programme was reported to have led to more applications for the programme than would have been the case with a more traditional method of funding.
- The funding mechanism was also reported to have supported the delivery of 5GIR projects, when compared to more traditional funding models, by:
  - reducing the time taken for decisions to be made about 5GIR projects within LAs, and
  - enabling delivery teams to be more flexible in the delivery of 5GIR projects.

5GIR areas faced challenges which meant that the delivery of 5GIR projects was delayed when compared to original plans:

- Most 5GIR areas found the delivery of their projects within the original timelines of the programme challenging. Factors cited by 5GIR areas as affecting the implementation of use cases included: unexpected factors impacting on delivery (e.g. operational challenges including the closure of Suez Canal delaying deliveries); underestimation of project management requirements; 5GIR areas' procurement processes taking longer than expected; and the added complexity of delivering stackable use cases amongst others.
- By the end of March 2025, the delivery of most 5GIR projects – in terms of delivery of use cases; realised benefits; and subsequent documentation and dissemination outside the intervention area – had been delayed when compared to what was originally expected (from 5GIR areas' initial plans). This was, in part, due to issues encountered by 5GIR areas during delivery and probably, in part, due to the optimistic nature of some 5GIR areas' original plans.

In terms of areas for improvement, the main areas identified include:

Improvements to the initial application guidance:

- The guidance and/or supporting materials could have been clearer about the nature of 5GIR funding and the purposes for which it could be used, e.g. for project management. Project leads identified a lack of project management capacity as an issue for delivery, and therefore increased clarity in the guidance on this point might have enabled 5GIR projects to resource more project management capacity from the start, which would have supported more effective delivery.
- The guidance could have been more explicit about how applicants might have procured the services for their individual project. DSIT officials felt that focusing procurements on the services to be provided, rather than the technicalities of how

[8] The funding method used for the 5GIR programme was predominately a non-ring fenced capital grant. One of the main reasons for using this mechanism was to provide LAs with increased flexibility and freedom to devise and deliver their plans.

such services were to be provided, would reduce the need for projects to spend time and resource on third parties and/or consultants.

Streamlined reporting requirements:

— Reporting requirements from DSIT and UKTIN could have been streamlined. Some 5GIR areas highlighted some level of duplication across DSIT and UKTIN requests, which unnecessarily increased the reporting burden.

Timely payment of grants:

— More timely payment of grants to some 5GIR areas would have better supported the delivery of some 5GIR projects.

Summary of the interim 5GIR impact evaluation findings

The overarching research question for the interim impact evaluation is: **to what extent did the 5GIR programme achieve the outcomes it set out to achieve within the timescale of the evaluation and to what extent can these outcomes be attributed to the programme?**

To help answer this overarching research question a number of supplementary evaluation research questions were developed. This section reflects the themes covered by the supplementary research questions and, therefore, considers: the delivery of realised benefits; documentation and dissemination; the fostering of a 5G ecosystem; the sustainability of projects; and long-term adoption of advanced connectivity services. The section finishes by concluding on the overarching evaluation question.

The evidence identified the following key findings:

Delivery of realised benefits: Whilst a large number of use cases had been implemented, few had yet realised benefits

— Eight of the 10 5GIR areas implemented 119 use cases spanning a range of sectors by March 2025, with the benefits from such use cases being monitored. This compared to plans for at least 144 use cases to be implemented from the initial 5GIR applications.

— However, whilst use cases had been implemented in all but two 5GIR areas by March 2025, in most cases their delivery had been delayed such that use cases had limited time to demonstrate, or realise, benefits.

— Attributing outcomes to the 5GIR programme is challenging without a robust comparison group. However, all 5GIR project leads and most network providers and use case stakeholders said the 5GIR project would not have taken place in the timescales of the original programme without DSIT funding. Whilst this suggests the delivery of 5GIR projects was largely attributable to the programme, the issue of attribution is not clear cut (particularly given the potential influence of previous programmes); it will be explored further as part of the final evaluation.

— Looking forward, by the end of March 2025, many of the factors required to realise benefits from projects were in place. Use cases had been (or were about

to be) implemented and outputs and outcomes from use cases were being actively monitored. This activity provides confidence that, in the extension period, evidence on the benefits from 5GIR projects will be realised.

Documentation and dissemination: A large number of dissemination events have been delivered, mainly within the 5GIR area

- In the period to March 2025, all 5GIR areas had been monitoring and reporting on their projects. However, the documentation of benefits realised from use cases had been limited given most areas had only just implemented use cases by March 2025.
- Just over 250 dissemination events sharing knowledge and findings from individual 5GIR projects had been delivered by March 2025. The majority of dissemination events occurred in two 5GIR areas. Moreover, most dissemination events had been focused on the individual 5GIR area itself, rather than wider dissemination outside the intervention area.
- Given the dissemination events related to the 5GIR programme and given LAs would have limited incentives to conduct dissemination activities without them being a requirement of the programme, the documentation and dissemination activity is considered to be largely attributable to the programme.
- Looking forward, to support delivery of programme objectives, the evaluation evidence suggests a key focus of dissemination activity should be on identifying and reaching those that are not aware or less interested in advanced wireless technologies. This should help increase the understanding among other organisations in 5GIR areas and beyond of the benefits of 5G and associated connectivity services.

Fostering a 5G ecosystem: 5GIR projects have involved a large number of delivery partners, engaged a large number of firms, and stakeholders consider that a 5G ecosystem has been developed

- Delivery of individual 5GIR projects involved a large number of delivery partners, with many of these representing new relationships formed as part of the programme.
- Meetings, workshops and various other forums had been used to share information across delivery partners and other stakeholders around the delivery of the 5GIR project.
- Data from the benefits trackers shows that, through various activities including working groups, use case demonstration events and workshops, the 5GIR programme had engaged over 1000 firms across a breadth of sectors.
- 5GIR project leads, network providers and use case stakeholders all commented positively on the relationships developed through the programme and the development of an advanced wireless technology ecosystem.
- Whilst some 5GIR areas did have pre-existing relationships with some of their suppliers/stakeholders, most areas needed to establish new relationships as part of their 5GIR projects. Indeed, some 5GIR areas struggled to identify and engage with relevant stakeholders at the start of their project. This suggests that much of the collaboration on 5GIR projects has been brought about between parties that

were not known to each other (or did not have an established relationship) before the programme and so were brought together as a direct result of the 5GIR programme. In addition, given that the majority of stakeholders involved in 5GIR projects said the project would not have gone ahead in the timescales of the original programme without DSIT funding, this suggests that much of this collaboration is attributable to the programme.

Sustainability of projects: Stakeholders say they expect existing networks and services to continue

- Whilst it is too early to conclude on the sustainability of projects post-DSIT funding, most 5GIR interventions were designed with some level of sustainability in mind.
- The long-term sustainability of 5GIR projects is dependent on three main factors. First, 5GIR projects need to document and evidence their viability. Second, the organisation or department with long-term responsibility for the advanced connectivity networks and/or services need to be convinced of its viability. Third, commitments among wider stakeholders need to be secured to support ongoing delivery.
- Strong documented evidence of the long term viability of most 5GIR projects did not exist at the end of March 2025. Despite the lack of documented evidence, network provider and use case stakeholders said they expected the advanced connectivity networks and services provided in 5GIR areas to continue into the future. Moreover, the level of additional funding generated by the projects, at just over £10 million, provides some confidence that ongoing private or public investment may be secured.
- Whilst it is not possible to categorically attribute this additional funding to the 5GIR programme without further investigating each individual contribution, evidence from the benefits trackers suggests close alignment of this funding with the projects themselves. This suggests the additional funding might not have been forthcoming without the project being delivered, and can therefore be attributed to the programme.

Long-term adoption of advanced wireless technology: Network providers and use case stakeholders to 5GIR projects expressed an increased appetite for investment outside 5GIR areas

- Direct evidence on the adoption of advanced wireless technology is difficult to gather from official statistics.
- Whilst it does not represent adoption per se, additional funding leveraged into 5GIR projects from both the public and private sectors as of March 2025 (over £10 million) provides evidence of the appetite to invest in advanced wireless technologies. Moreover, stakeholders in 5GIR projects reported an increased inclination to invest in advanced connectivity networks and services outside 5GIR areas as a result of the project (with no discernible trend across sectors).
- In assessing the extent to which the stated investment intentions of 5GIR stakeholders are likely to be attributable to the 5GIR programme or not, evidence shows that investment in 5G in the UK in recent years has been lower than in the

EU and US. This would suggest that, if 5GIR stakeholders' investment intentions, outlined above, are realised, then the 5GIR programme might have had a positive impact on organisations' investment intentions.

Conclusion: The 5GIR programme has achieved a lot of the outcomes, although not all, that it originally set out to achieve, and is in a good position to deliver more outcomes in the extension period.

- Taking all the evidence together, by March 2025, the 5GIR programme had:
  - Implemented the majority of originally planned use cases
  - Delivered just over 250 dissemination events
  - Involved a large number of delivery partners in the delivery of projects with stakeholders stating that a 5G ecosystem had been developed
  - Leveraged just over £10 million in additional funding into projects with stakeholders stating that they expect existing networks and services to continue
  - Increased stakeholders in 5GIR projects' inclination to invest in advanced connectivity networks and services outside 5GIR areas as a result of the project
- The main areas where delivery fell below original expectations included the fact that most 5GIR projects had not been able to evidence realised benefits and/or disseminate their learning beyond their immediate area within the original timeframes for the programme.
- With the extension to the programme, 5GIR areas are in a good position to evidence realised benefits from implemented use cases. This should enable the documentation and dissemination of benefits derived from the use cases. The dissemination of the findings on benefits should help improve the understanding of organisations around the benefits of advanced wireless technology adoption and so increase economic activity and investment. These are all aspects for 5GIR areas to focus on in the extension period in order to support the programme in achieving its objectives.
- The final evaluation, due to be conducted following the completion of the programme in 2026, will consider the extent to which these activities, outputs and outcomes have been achieved and, as a result, the extent to which the 5GIR programme can be expected to drive economic growth and accelerate commercial investment in advanced connectivity services in the next few years.

1 Introduction

1.1 Introduction to this report

To support the Department for Science, Innovation and Technology's (DSIT) ambition to deliver world-class digital infrastructure across the UK, drive innovation and unlock opportunities for economic growth, DSIT established the 5G Innovation Regions (5GIR) programme.

The 5GIR programme aims to drive innovative applications powered by 5G from proof of concept to widespread adoption. Innovation Regions aim to demonstrate and adopt 5G and other advanced wireless use cases across key sectors of the economy. Each 5G Innovation Region, led by LAs, plans to demonstrate the scalability, replicability, and sustainability of use cases, and disseminate project learnings and benefits.

Programme delivery commenced in November 2023 and was originally planned to run until March 2025. In late 2024, as part of the 2025-26 spending review process, DSIT extended the 5GIR programme. While two projects were initially extended for a further 6 months only, ultimately all 5GIR projects were extended for 12 months through to March 2026.

This report provides an interim evaluation of the 5GIR programme, comprising an interim process and impact evaluation based on the position as at the end of March 2025.

In delivering this interim evaluation KPMG has worked closely with the DSIT evaluation project team[9] (hereafter referred to as the DSIT evaluation team) who are thanked for their input and support throughout the evaluation.

1.2 Overview of the 5GIR programme

The allocation of funding and support, through the 5GIR programme, aimed to enable places across the UK to unlock opportunities which utilised advanced wireless connectivity, supporting the following strategic objectives of the programme, to:

- Drive economic growth across the UK by supporting places to adopt advanced wireless technologies for services based around local opportunities for growth.
- Accelerate commercial investment in 5G and other advanced wireless technologies by aggregating and demonstrating demand.
- Foster the emergent 5G ecosystem[10].

[9] The DSIT evaluation project team has overall responsibility for the evaluations and provides ongoing input and direction in relation to the evaluation such that it meets DSIT's requirements; the team is comprised of DSIT officials.
[10] The original strategic objective was stated as, "Foster the emergent 5G ecosystem by enabling learning by doing". However, through the process of delivering the interim evaluation both KPMG and DSIT felt that this objective was unnecessarily restrictive. By deleting, "… by enabling learning by doing" more activity involved in contributing to a 5G ecosystem was able to be captured by the evaluation. As a result, in what follows the shortened version of the strategic objective is used.

In July 2023, DSIT invited applications for funding from LAs across the UK to establish themselves as '5G Innovation Regions'. Following a competitive process, 10 regions were notified of their success by DSIT in November 2023.

Since November 2023, regions have been developing and delivering the interventions which have typically involved a range of stakeholders. Stakeholders include 'network providers' (which includes Mobile Network Operators (MNOs)) who provide the underlying telecom networks and connectivity services to the intervention, and 'use case stakeholders' which includes providers, users and procurers of advanced connectivity use cases and associated technologies/solutions. The intention was for the regions to target key sectors[11] identified by DSIT as having high potential for local economic growth and productivity gains. DSIT officials, particularly technical advisers, are providing support and assistance to 5GIR areas and UKTIN is providing support around dissemination activities.

1.3 About the evaluation

Government departments are expected to undertake comprehensive, robust and proportionate evaluations of their policy interventions in order to understand how policies and programmes are working and to ensure the best value for public money. To that end, in February 2024, DSIT commissioned KPMG to undertake the programme-level evaluation of 5GIR.

In May 2024, KPMG produced a scoping and baseline report[12], signed off by DSIT, setting out: the research questions to be answered by the 5GIR evaluation; the approach to the evaluation; and its associated timings. The subsequent evaluation activity has followed the methodology set out in the scoping and baseline report, which was designed to align with guidance set out in HM Treasury's Magenta Book and Green Book.

As commissioned, the evaluation of the 5GIR programme was to include:

- a scoping and baseline report
- six-monthly reporting
- a process evaluation covering both the application process and the design and delivery of the programme
- a final impact evaluation
- an economic evaluation

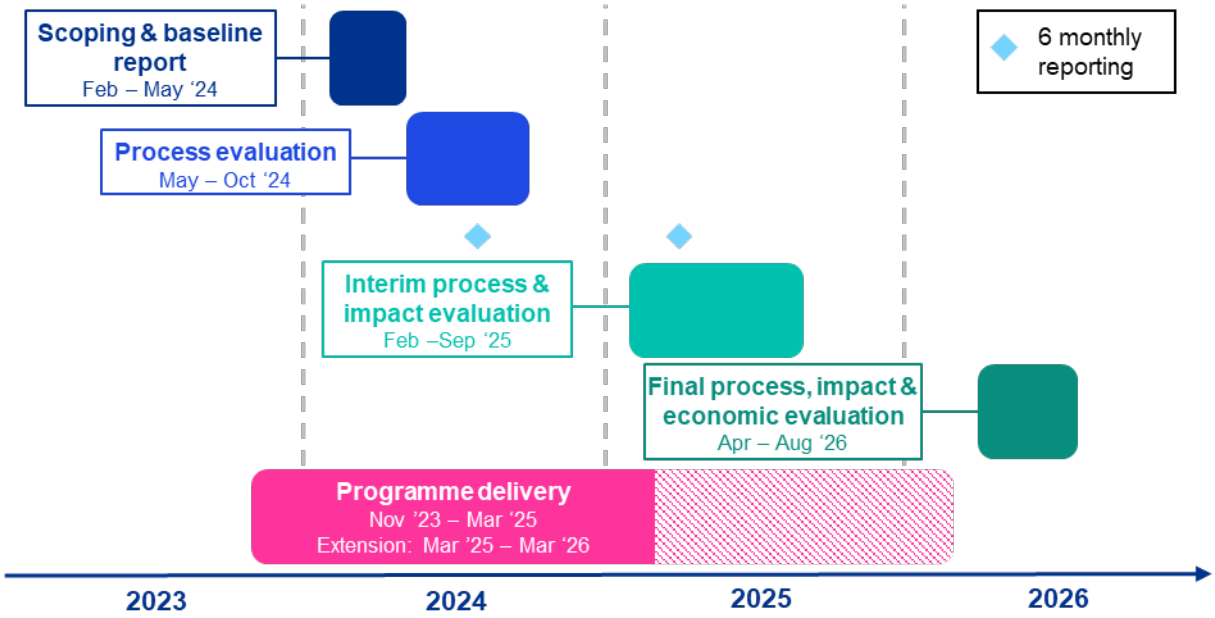
Following the extension to the programme, it was agreed with DSIT that an interim process and impact evaluation of the 5GIR programme would be conducted between

[11] The original application guidance noted that these sectors, "will vary by area, but should include: public services (including "smart communities" applications); rural industries (including agri-tech and food production); transport and logistics; advanced manufacturing; and creative industries".
[12] KPMG, 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report, May 2024

May and October 2025 with the final process, impact and economic evaluations following after the programme concludes in March 2026.

This report covers findings from both the interim process and impact evaluation. The different elements of the evaluation and respective timings are set out in Figure 1.1 below.

Figure 1.1: Elements of the 5GIR evaluation and associated timings



A brief summary of each element of the evaluation is set out below.

Scoping and baseline report: The scoping stage of the evaluation sought to understand the nature of the intervention, the research questions that needed to be answered and developed a framework for delivering the evaluation. The output from the scoping phase was a scoping report accompanied by a baseline for the evaluation. The purpose of the baseline was to set out the situation at the start of the programme, before any intervention-related activity had taken place, to allow for comparison with observed outcomes and impacts post-intervention.

Six-monthly reporting: Updates on the progress of the 5GIR projects was provided to DSIT through 6-monthly updates in August 2024 and April 2025[13]. This reporting was in the form of a dashboard with the data reported based on information gathered from the DSIT benefits trackers.

Process evaluation of the application process: The process evaluation of the application process for the 5GIR programme was conducted between May and October 2024. This evaluation answered the evaluation research question: "what went well and what could be improved with regard to the 5GIR programme, specifically in relation to the application process?". The main themes covered in the evaluation included: how the programme was originally advertised; how much

[13] These dates reflect the time by which completed benefits trackers were received from all 5GIR intervention areas

interest in the programme was generated through advertising and marketing activity; what impact the funding method proposed for the programme had on applications; and areas for improvement in the application process.

Interim process and impact evaluation: The interim 5GIR evaluation, which this report covers, comprises an interim process evaluation and an interim impact evaluation. The scope of the interim evaluation closely follows the design of the final process and impact evaluations set out in the scoping and baseline report and covers the activity and outputs/outcomes achieved up to the end of March 2025. This evaluation, therefore, does not attempt to provide a final view on the overall impact of the 5GIR programme, but seeks to provide an interim view of how projects are progressing towards the delivery of the intended outcomes. The evaluation seeks to answer the following two overarching evaluation research questions:

- Process evaluation: What went well and what could be improved with regard to the 5GIR programme, specifically in relation to the design and delivery (from both a DSIT and LA/partner organisation perspective)?
- Impact evaluation: To what extent did the 5GIR programme achieve the outcomes it set out to achieve within the timescale of the evaluation and to what extent can these outcomes be attributed to the programme?

These questions were developed in collaboration with the DSIT evaluation team[14] and reviewed and agreed by the Steering Group[15] as part of the scoping phase of the evaluation. In this report they are considered in the context of the delivery of projects up to the end of March 2025.

In order to answer the overarching evaluation research question, additional research questions are considered for each of the process and impact evaluations. These supplementary questions are set out in Section 2.1.1 and Section 2.1.2 respectively.

Final process, impact and economic evaluation: The final 5GIR evaluation will comprise a process evaluation, an impact evaluation, and an economic evaluation. This evaluation will provide a final view on the overall impact of the programme and will answer the same evaluation research questions as set out above for the interim evaluation.

1.4 Structure of this report

The purpose of this report is to present the findings from the interim process and impact evaluation relating to the 5GIR programme.

The rest of this report is structured as follows:

- Section 2 sets out the approach to the interim evaluation, including:

[14] This team has overall responsibility for the evaluations and is providing ongoing input and direction in relation to the evaluations such that it meets DSIT's requirements.
[15] This group was established with the role of providing advice, guidance, scrutiny and challenge to the evaluation, with the aim of supporting the evaluation and ensuring the findings are robust and provide useful insights to build the evidence base in relation to digital infrastructure. It consists of DSIT officials covering the areas of policy, analysis, benefits realisation and technical expertise with respect to the 5GIR programme, together with a member of Cabinet Office's Evaluation Taskforce.

  - the methodologies to be used for both the interim process and interim impact evaluation – detailed in Section 2.1
  - sources of information used to answer the evaluation research questions – detailed in Section 2.2
  - the approach to the interview and surveys used to answer the evaluation research questions for the 5GIR programme – detailed in Section 2.3
- Section 3 reports the main findings from the interim process evaluation for the 5GIR programme
- Section 4 reports the main findings from the interim impact evaluation for the 5GIR programme

2 Approach to the interim process and interim impact evaluation

2.1 Evaluation methodologies

2.1.1 Interim process evaluation

This interim process evaluation examines how the processes employed in the delivery of the 5GIR programme up to the end of March 2025 have contributed to the programme's outcomes and any lessons learnt for future delivery. The evaluation seeks to answer the overarching evaluation research question, and the supplementary questions (which were developed to help inform answering the overarching research question). These are set out in Table 2.1 below.

2.1.1.1 Evaluation research questions for the interim process evaluation

What went well and what could be improved with regard to the 5GIR programme, specifically in relation to the design and delivery (from both a DSIT and LA/partner organisation perspective)?

- Whether the delivery of the programme went as expected?
- Whether the spreading of knowledge outside the intervention areas worked as expected?
- Whether there was anything that could have been improved with respect to the design and/or delivery of the programme?
- Whether the funding of the programme influenced its delivery and effectiveness?

A range of research and data collection methods have been employed to obtain the evidence needed to answer the interim process evaluation research questions. These include a review of programme documentation; interviews with 5GIR areas, DSIT officials and UKTIN officials; and two surveys of stakeholders to the various 5GIR projects (one covering network providers to the projects and one covering stakeholders to the use cases for the projects). This evidence is brought together and thematic analysis conducted to identify key themes and insights from the various stakeholders and data sources. Through this process an assessment is made of how the specific processes and approaches adopted for the 5GIR programme have affected the overall delivery of the programme through to the end of March 2025. Any lessons that can be learnt from the delivery of the programme are also outlined.

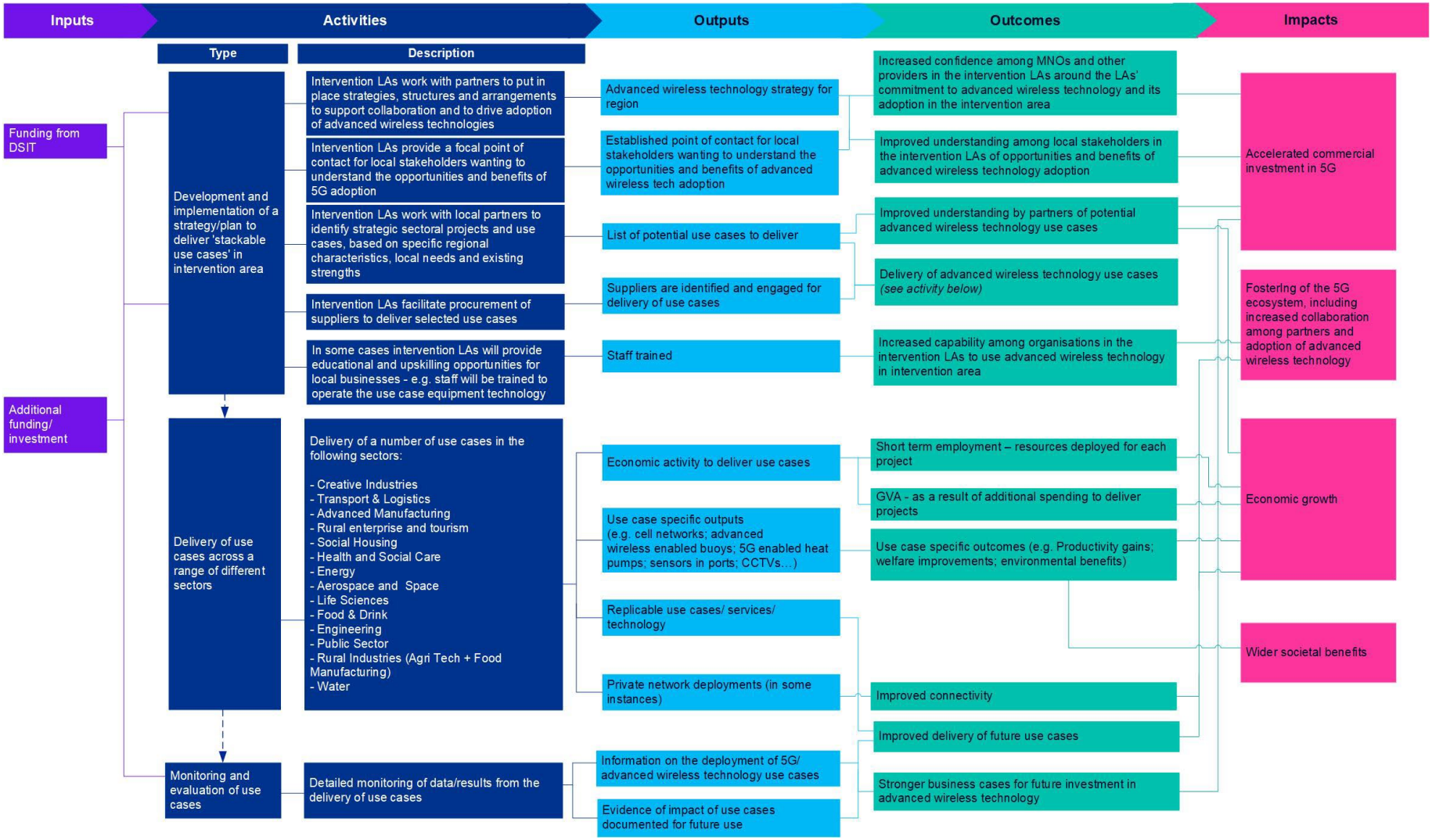
2.1.2 Interim impact evaluation

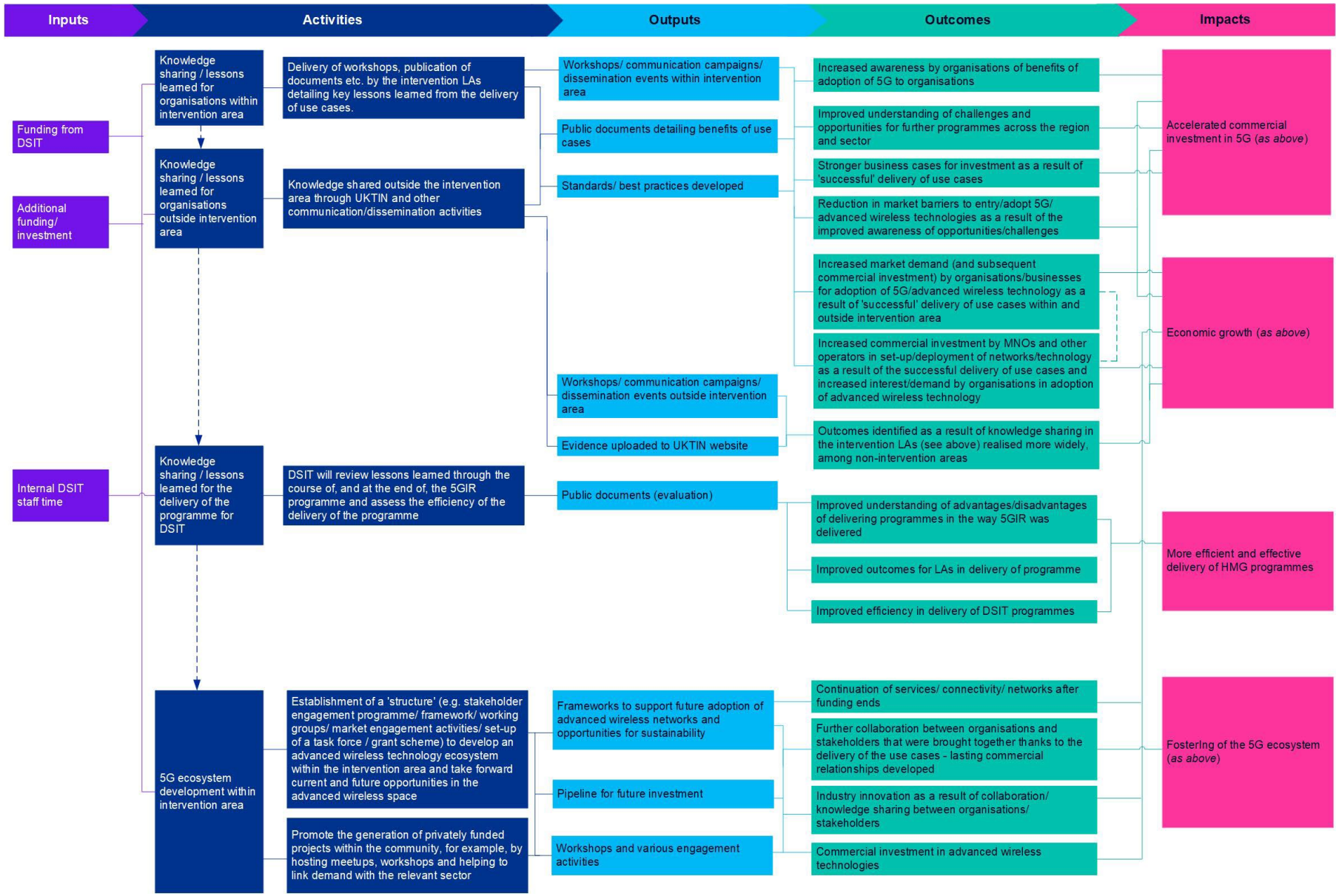
The purpose of the interim impact evaluation is to assess what changes have occurred up to the end of March 2025 as a result of the 5GIR programme and the extent to which such changes can be attributed to the programme itself.

To support this assessment, evidence around the existence and strength of the linkages set out in the Theory of Change (ToC) is considered. The ToC, set out in Figure 2.1 below (with more detailed narrative set out in the scoping report),

illustrates the changes that the 5GIR programme is seeking to make, how they are expected to happen, and the measurable outputs, outcomes and impacts associated with the intended change. In the context of the interim impact evaluation it should be noted that the activities within the ToC are not expected to happen concurrently. Rather, as illustrated by the arrows between activities, activities are expected to happen sequentially and can only be fully completed once prior activities and associated outputs have been delivered – creating a series of dependencies within the ToC.

Figure 2.1: 5GIR ToC




Inputs
Activities
Outputs
Outcomes
Impacts
Funding from DSIT
Additional funding/ investment
Internal DSIT staff time
Knowledge sharing / lessons learned for organisations within intervention area
Knowledge sharing / lessons learned for organisations outside intervention area
Knowledge sharing / lessons learned for the delivery of the programme for DSIT
5G ecosystem development within intervention area
Delivery of workshops, publication of documents etc. by the intervention LAs detailing key lessons learned from the delivery of use cases.
Knowledge shared outside the intervention area through UKTIN and other communication/dissemination activities
DSIT will review lessons learned through the course of, and at the end of, the 5GIR programme and assess the efficiency of the delivery of the programme
Establishment of a 'structure' (e.g. stakeholder engagement programme/ framework/ working groups/ market engagement activities/ set-up of a task force / grant scheme) to develop an advanced wireless technology ecosystem within the intervention area and take forward current and future opportunities in the advanced wireless space
Promote the generation of privately funded projects within the community, for example, by hosting meetups, workshops and helping to link demand with the relevant sector
Workshops/ communication campaigns/ dissemination events within intervention area
Public documents detailing benefits of use cases
Standards/ best practices developed
Workshops/ communication campaigns/ dissemination events outside intervention area
Evidence uploaded to UKTIN website
Public documents (evaluation)
Frameworks to support future adoption of advanced wireless networks and opportunities for sustainability
Pipeline for future investment
Workshops and various engagement activities
Increased awareness by organisations of benefits of adoption of 5G to organisations
Improved understanding of challenges and opportunities for further programmes across the region and sector
Stronger business cases for investment as a result of 'successful' delivery of use cases
Reduction in market barriers to entry/adopt 5G/ advanced wireless technologies as a result of the improved awareness of opportunities/challenges
Increased market demand (and subsequent commercial investment) by organisations/businesses for adoption of 5G/advanced wireless technology as a result of 'successful' delivery of use cases within and outside intervention area
Increased commercial investment by MNOs and other operators in set-up/deployment of networks/technology as a result of the successful delivery of use cases and increased interest/demand by organisations in adoption of advanced wireless technology
Outcomes identified as a result of knowledge sharing in the intervention LAs (see above) realised more widely, among non-intervention areas
Improved understanding of advantages/disadvantages of delivering programmes in the way 5GIR was delivered
Improved outcomes for LAs in delivery of programme
Improved efficiency in delivery of DSIT programmes
Continuation of services/ connectivity/ networks after funding ends
Further collaboration between organisations and stakeholders that were brought together thanks to the delivery of the use cases - lasting commercial relationships developed
Industry innovation as a result of collaboration/ knowledge sharing between organisations/ stakeholders
Commercial investment in advanced wireless technologies
Accelerated commercial investment in 5G (as above)
Economic growth (as above)
More efficient and effective delivery of HMG programmes
Fostering of the 5G ecosystem (as above)

In order to help answer the overarching evaluation research question, the ToC was used to support the development of supplementary research questions (which are set out in the table below). These supplementary questions test the extent to which early causal links in the ToC have been demonstrated and, therefore, whether future outcomes and impacts are likely to be realised. As such, the supplementary questions focus on the key intended outcomes of the programme expected to be achieved within the evaluation timescales (up to the end of March 2025). The questions were designed to support a theory-based evaluation methodology as proposed within the scoping and baseline report[16].

2.1.2.1 Evaluation research questions for the interim impact evaluation

To what extent did the 5GIR programme achieve the outcomes it set out to achieve within the timescale of the interim evaluation and to what extent can these outcomes be attributed to the programme – specifically:

- To what extent did the 5GIR interventions provide evidence of the realisable benefits of advanced wireless technologies?
- To what extent were the benefits of advanced wireless technology adoption from the 5GIR programme documented and disseminated?
- To what extent has the 5GIR programme fostered an emergent 5G ecosystem?
- To what extent were the 5GIR interventions sustainable post-Government funding (i.e. networks continued after funding)?
- To what extent is there evidence of the 5GIR programme encouraging and/or increasing long-term adoption of advanced wireless technology?

To answer the overarching research question and assess the impact of the programme, in the absence of viable quasi-experimental methods,[17] a theory-based approach to the 5GIR interim impact is applied. Contribution analysis (CA) was selected at scoping stage as the most appropriate theory-based approach for this evaluation, due to its ability to assess attribution by exploring the range of contributing factors and causal mechanisms.

CA tests the extent to which the chains of causality and underlying assumptions in the ToC are confirmed, or challenged, by the evidence available. It assesses attribution by examining the strength of the causal links in the ToC. This is done by analysing observed changes in outcomes (relative to baseline), evidence that activities and outputs have contributed to these outcomes, and considering alternative explanations or other influencing factors that might have influenced programme related outcomes.

Data and evidence gathered as part of the evaluation is used to validate the ToC. This assessment includes consideration of the following three areas:

[16] 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report. May 2024
[17] 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report. May 2024

- Achievement of programme outcomes – assessment of the evidence to confirm whether the programme was implemented as planned and whether the expected outputs and outcomes were observed.
- Evidence to support the assumptions within the ToC and the logical links at each stage – assessment of the evidence to confirm, disconfirm, or call into question the causal assumptions.
- Analysis of other influencing factors – examination of the evidence in relation to whether other factors, non-programme related, might have an influence on the outcomes observed.

More detail on the indicators that are used to evidence the outputs and outcomes achieved through the programme are set out in Appendix 1.

While CA is considered the most appropriate approach to use, based on the stage of the programme and the evidence available, it is too early to apply fully a CA framework. This is because outputs and outcomes are still emerging and/or uncertain. As a result, for this report, initial thinking around the contribution story and a preliminary narrative of how the programme is contributing to change is presented. The analysis is structured around the evaluation research questions which are designed to help consider the cause-effect links in the ToC expected to have been realised by the end of March 2025.

Sections 3 and 4 consider the findings of the interim process and interim impact evaluation. Evidence on the activities, outputs and outcomes from the ToC are collated from a variety of sources to help answer each of the impact evaluation research questions in the way outlined above.

2.2 Sources of information

2.2.1 Overview of sources of information

The evaluation draws on the following sources of data and information:

- Programme documentation – in particular:
  - 5GIR benefits trackers[18]
  - 5GIR sector deployment reports[19]
- Interviews with project leads from 5GIR areas regarding the delivery and impact of their projects to the end of March 2025.[20]
- An interview with DSIT officials responsible for policy and technical delivery, in relation to the delivery and impact of the programme to the end of March 2025.
- An interview with officials from UKTIN on the documentation and dissemination events conducted in relation to the programme to the end of March 2025. The

[18] The benefits tracker is a spreadsheet completed by 5GIR projects and used to track progress against each project's intended benefits.
[19] Sector deployment reports were produced by 5GIR areas to capture the learnings from each individual 5GIR project.
[20] One of the 5GIR areas provided their thoughts on delivery and impact by written correspondence rather than by way of an interview.

interview was to cover the support, collaboration and dissemination work that UKTIN had conducted to support the 5GIR programme.

— Surveys of other stakeholders involved in the 5GIR projects, one covering network providers to the projects and one covering stakeholders to use case for the projects.

2.2.2 Programme monitoring and reporting

All 5GIR areas were required to provide a benefits tracker spreadsheet to DSIT each quarter. The tracker was designed to record:

— All benefits associated with the 5GIR project: The tracker was the main tool used to track progress against each project's intended benefits. This included technical, financial and non-financial benefits. In addition, the tracker recorded the baseline and target information for each benefit measure.

— Lessons that emerged from each project: This included lessons specifically for the 5GIR project, lessons that might be relevant to the broader sector, or lessons for DSIT specifically.

— Knowledge creation and dissemination activities for each 5GIR project: Both planned (e.g. in the coming quarter) or undertaken (in the preceding quarter).

At the end of the original programme timeline (March 2025), all 5GIR areas were also required to produce a sector deployment report for each sector covered by the 5GIR project. The objective of the reports was to capture the learnings from each 5GIR project up to the end of March 2025, which through wider dissemination of the learnings (through DSIT and UKTIN networks for example) would allow use cases to be adopted and implemented more efficiently and effectively in sectors across the UK.

2.2.3 Interviews

As shown in Table 2.3 below, KPMG conducted a total of 11 semi-structured interviews with a range of programme stakeholders. The objective of the interviews was to obtain insights and, primarily, qualitative evidence to inform the interim evaluation. An interview guide was developed for use in the interviews. All comments from the interviews have been anonymised. The individuals to be interviewed were selected based on their involvement in the delivery of the 5GIR interventions and were agreed between KPMG and the DSIT evaluation team (with particular input from the DSIT technical advisers).

Table 2.1: Interviews conducted for the 5GIR interim evaluation

Interview	No. of interviews	No. of individuals interviewed	Length of interview
5GIR areas (project leads)	9*	16	1 hour
DSIT officials	1	7	1.5 hours
UKTIN officials	1	3	1 hour
Total	11	26	

* Note: One 5GIR area asked to respond to the interview questions by written correspondence

2.2.3.1 Interviews with 5GIR areas

Interviews were held with individuals leading on the delivery of 5GIR interventions.

The interviews sought to obtain information and views on the following aspects:

- delivery of the project, including procurement
- support received from DSIT
- how the funding mechanism influenced the delivery of the project
- documentation and dissemination of learning from the project
- outputs and benefits achieved
- the extent to which an ecosystem (that is a network of parties interested in advanced wireless technologies) has been developed in the area

2.2.3.2 DSIT officials' interview

One interview was held with DSIT officials involved in the design and delivery of the 5GIR programme. Participants included officials involved in the original design of the programme and the subsequent delivery of the programme (including technical advisers to the programme).

The interview sought to obtain information and views on the following aspects:

- the overall delivery of the programme
- the support provided by DSIT to 5GIR areas
- how the funding mechanism influenced the delivery of the project
- documentation and dissemination of learning from the project
- outputs and benefits achieved
- the extent to which an ecosystem (that is a network of parties interested in advanced wireless technologies) has been developed in areas

During the interview, when a particular point was made by a DSIT official, other participants had the opportunity to provide alternative views and perspectives. Where no other alternative views were put forward, and no DSIT officials disagreed with the point made, this was taken as the consensus view among the group. As a result, when reporting on the findings from the interim evaluation, statements are reported as the views of DSIT officials where such a consensus was achieved.

2.2.3.3 UKTIN interview

One interview was held with officials from UKTIN involved in the documentation and dissemination activities in the 5GIR programme. UKTIN supported collaboration and dissemination activities conducted as part of the 5GIR programme.

The interview sought to obtain information and views primarily on the documentation and dissemination of learning from the 5GIR interventions, including any evidence of impact.

2.2.4 Surveys

2.2.4.1 5GIR network provider and use case stakeholder surveys

All 5GIR areas were asked for contact details of the organisations providing network services and use cases to each individual 5GIR project in their area. A survey was sent to all these organisations: 18 organisations for the network provider survey and 63 organisations for the use case stakeholder survey.

Table 2.4 below sets out the responses received to each of the surveys conducted.

Table 2.2: Responses to the network and use case stakeholder surveys for the 5GIR interim evaluation

Survey	No. of 5GIR areas surveyed	No. of 5GIR areas respond-ing	Total no. of responses	No. of organ-isations contacted	Organ-isation response rate
Network provider	10	9	13	18	72%
Use case stakeholder	9*	9	45	63	71%

Note: Use case stakeholders in one 5GIR area were not surveyed given the project's stage of delivery
Total number of responses exceeds number of 5GIR areas responding because there can be more than one network provider, and particularly use case stakeholders, in a 5GIR area.

The survey was built using an online survey tool and covered the following topics:

- the procurement process undertaken by the 5GIR area
- the providers' experience of delivery of the 5GIR intervention
- the extent to which on-going relationships were established by the project
- whether the network was likely to continue to be provided after funding ceased

The surveys were run during July 2025 and closed on 4th August 2025.

The use case stakeholder survey includes providers of use case technology and/or services to 5GIR projects as well as procurers and users of the use cases. In the survey respondents were invited to answer the questions as best they could from their respective points of view. In this report, the results are presented for use case stakeholders as a whole. More detailed analysis of the survey results (splitting responses by use case suppliers and use case buyers or users) was conducted but did not show any material difference in the main findings.

2.3 Caveats and limitations

When interpreting the findings of this interim evaluation there are a number of caveats and limitations to be aware of:

- At the time of the evaluation (based on the period up to end of March 2025) many of the use cases had been operational for a relatively short amount of time and

some use cases had yet to be implemented. This meant that, as of end March 2025, many benefits were yet to be realised from the 5GIR interventions and so the evaluation does not capture the full impacts of the programme.

- Much of the evidence for the interim evaluation has been drawn from interviews and surveys with programme stakeholders. A limitation of this approach is that it relies on self-reporting of the effectiveness of 5GIR areas' delivery and reasons for any delays or failures, which may contain bias. To mitigate the impact of this, the outputs from the interviews and surveys have been reviewed against one another for consistency as well as other sources of information (e.g. programme documentation, benefits trackers) to consider the extent to which the findings from the interviews and/or surveys are supported, or otherwise, by other evidence.
- The quantitative recording of project-level benefits has been undertaken by each 5GIR area individually. This creates a risk of inconsistency in reporting across 5GIR areas (as well as between 5GIR projects within individual areas). Steps have been taken to minimise this risk, through provision of guidance and support to 5GIR areas by DSIT and KPMG in relation to the completion of the benefits tracker. In addition, benefits trackers have been checked and any identified inconsistencies or concerns raised with individual 5GIR areas. Nevertheless, this evaluation is reliant on the accuracy and completeness of data provided.

3 Findings of the interim process evaluation

3.1 Introduction

The findings set out in the following sections seek to answer the overarching interim process evaluation research questions for the 5GIR programme which is: What went well and what could be improved with regard to the 5GIR programme, specifically in relation to the design and delivery (from both a DSIT and local authority (LA)/partner organisation[21] perspective)?.

To do this a number of supplementary research questions are considered before concluding on the overarching research question. The supplementary research questions are:

- Whether the delivery of the 5GIR programme went as expected?
- Whether the spreading of knowledge outside the intervention areas worked as expected?
- Whether the funding of the programme influenced its delivery and effectiveness?
- Whether there was anything that could have been improved with respect to the design and/or delivery of the programme?

Each section considers the main findings relating to the particular evaluation research question - based on the evidence gathered and detailed in Section 2.

3.2 Finding: Whether the delivery of the 5GIR programme went as expected

3.2.1 Introduction

This section considers the extent to which the delivery of the 5GIR programme went as expected. To do this the section considers delivery at the programme level and project level separately.

The section starts by considering some of the main factors identified as affecting delivery at the 5GIR programme level. This includes consideration of:

- Delivery timescales for the programme set at the application stage
- Provision of grants to 5GIR areas
- Support provided by DSIT to 5GIR areas in the delivery of their projects

The section then considers factors that were identified as impacting the delivery at the individual 5GIR project level before concluding on this research question.

[21] Where partner organisation refers to other stakeholders involved in the delivery of 5GIR interventions

In answering the research question a range of evidence is drawn on including the initial application guidance, benefits trackers, interviews with DSIT officials and 5GIR areas.

3.2.2 Evidence on whether the delivery of the 5GIR programme went as expected

3.2.2.1 Factors affecting delivery at the programme level

Delivery timescales for the 5GIR programme

The initial 5GIR application guidance noted that all DSIT grant funded activities relating to the 5GIR programme were to be completed by 31st March 2025. DSIT officials said that the original timescales for the programme were constrained by the spending review cycle which meant the funds for the programme needed to be disbursed by March 2025.

In the interview, DSIT officials acknowledged the difficulty of delivering realised benefits within the programme's original timeframe. For instance, it was noted that for projects delivering agri-tech use cases, a number of seasons will need to pass for the beneficial impact of the use of advanced wireless technology on crop yields (e.g. monitoring soil moisture; temperature etc) over and above existing methods to be evidenced. Therefore, the full benefits from individual projects will take a long time after the delivery of the technology to come to fruition and be clearly evidenced. Officials from UKTIN also acknowledged the challenging nature of the original timelines for delivery of realised benefits from 5GIR interventions.

DSIT officials reported that these factors contributed to the decision to extend the timescales for the programme. For some projects this is expected to enable them to develop into new areas and deliver a wider range of use case benefits and for others it is expected to enable them to complete delivery of their projects in order for benefits to be realised and documented.

In interviews, most 5GIR project leads felt that the March 2025 deadline was unrealistic for full project delivery (including the realisation of benefits). Project leads viewed the delivery timeframe as too short for infrastructure projects of this scale and complexity. Indeed, many project leads highlighted the technical and innovative nature of much of what was being delivered – meaning that challenges and, therefore, delays were more likely to occur with such projects. Most 5GIR project leads said that whilst many use cases had been implemented during the original timeframe, measuring benefits would require longer timeframes.

To that end, a few project leads suggested that, in the future, DSIT might want to consider splitting the delivery of infrastructure and the realisation of benefits into two separate phases of the programme. This would involve the majority of the funding being spent in the initial infrastructure delivery phase but with a much smaller funding provision, primarily to cover project management costs, made for later years to allow for projects to continue to run and for benefits to be realised and documented.

Given the longer term nature of many of the outcomes and impacts from the programme the suggestion of structuring the programme in two distinct phases, the first covering the physical delivery of any infrastructure/services and the second, longer, period monitoring the delivery of benefits might be something to consider for future programmes. Whilst this would involve the commitment of resources outside spending review cycles, the amount could be relatively small and it might provide for a more robust assessment of the programme's impact in the longer term.

Lastly, a small number of project leads credited the compressed timeline with driving efficiency in delivery of the projects. However, some other project leads felt that the short timescales led to sub-optimal decisions needing to be made (in order to deliver the project in the original timelines).

Provision of grants to 5GIR areas

The initial 5GIR application guidance outlined that applicants would be notified of a successful application to the programme in mid-late October 2023 with project mobilisation starting in November 2023. The grant funding period was stated as starting from November 2023 (through to March 2025) but subject to successful applicants' satisfactory completion of any pre grant requirements and commercial agreements.

In the interviews, three 5GIR areas said that there was a delay in the receipt of their grant funding, following their successful application. The benefit trackers illustrate that these 5GIR areas didn't receive their grant until January/February 2024. These areas said this affected their delivery timelines, stating that the delay limited their ability to progress with early stage project activities which hindered the procurement of supplies and prevented the establishment of grant funding agreements with delivery partners. DSIT officials noted that some LAs were unable to operate at risk so did not progress with their projects until MOUs were signed. DSIT officials also reported that the delays to the signing of MOUs were mainly the result of queries from LAs regarding subsidy control.

DSIT delivery support to 5GIR areas

In the interviews, all 5GIR project leads highlighted that DSIT consistently provided strong technical support to their projects. 5GIR areas said this support included: technical advice on the delivery and capability of advanced connectivity networks and services; advice on how to deal with government or regulatory stakeholders (like Ofcom for example); and practical introductions or suggestions as to potential suppliers for different advanced connectivity networks and services. Many project leads commented that DSIT was both flexible and supportive in its approach to their projects and that the support provided had helped with the delivery of their projects. Some 5GIR project leads also noted the value of the site visits that DSIT officials had made to their projects which, in a number of cases, were also considered to have helped with delivery. Specifically, one 5GIR area said that the site visit helped keep use case stakeholders engaged with the project when delays were being experienced and another area said the site visit improved DSIT's understanding of the intervention and so enabled more effective support and advice to the project.

In line with this feedback, DSIT officials felt that 5GIR areas had received a lot of non-funding and in-kind support from DSIT. This included technical advisers working

closely with projects on their delivery – acting as a critical friend and being more involved in supporting the delivery of projects than may have, traditionally, been the case with programmes. DSIT also noted that support had been provided to 5GIR areas on communications.

Clarity of 5GIR strategic objectives

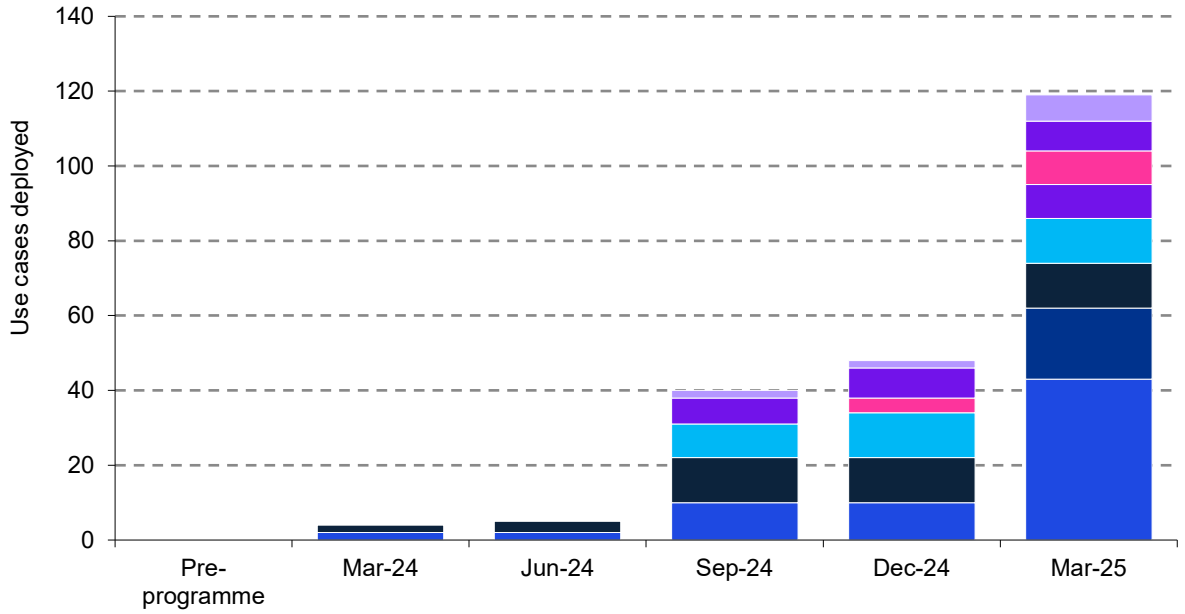
In the interview, DSIT officials said that the focus of the 5GIR programme on three strategic outcomes (adoption leading to economic growth; investment leading to sustainability; and development of an ecosystem) provided a clarity of purpose for the programme. DSIT technical advisers said this helped them in discussions with 5GIR areas because they could keep referring back to the three objectives to ensure projects remained focused on the core objectives of the programme. Whilst 5GIR areas were positive about the technical support provided by DSIT (as set out above), they did not specifically mention the focus on the three strategic objectives, suggesting this was more of a benefit to DSIT officials in their discussions than something that was explicitly recognised by areas.

3.2.2.2 Factors affecting the delivery of individual 5GIR projects

Delivery of use cases

Figure 3.1 below shows the total number of use cases implemented (i.e. according to the 5GIR area the use case is set up and operational) across the 5GIR programme (split by individual 5GIR projects) in the period to March 2025. The chart shows that the number of use cases implemented reached 119 by March 2025 which compares to plans for at least 144 use cases in 5GIR areas' initial applications. Almost 60 per cent of use cases were implemented in the last three months (i.e. between December 2024 and March 2025). The majority of 5GIR areas had planned for their advanced connectivity networks and use cases to be implemented during 2024 to allow for the operation and testing of use cases from, in the main, the second half of 2024 through to the end of March 2025. However, Figure 3.1 shows that the vast majority of use cases were implemented in the very last quarter of the programme's original timelines, meaning that 5GIR areas had very little time to operate and test use cases and therefore, very little time to achieve, and/or measure, any benefits from the use cases.

Figure 3.1: Total number of use cases implemented on the 5GIR programme over time (split by anonymised 5GIR project with each colour representing a separate area)



Source: KPMG analysis based on 5GIR benefits tracker data

The chart also shows that the implementation of use cases has been concentrated in certain 5GIR areas. Half of all use cases implemented are attributable to two 5GIR areas. This reflects the different design of 5GIR interventions, including the sectors targeted, as well as interventions having developed at different speeds. Data from the benefits trackers, taken together with information provided through interviews and the sector deployment reports, identified that most of the use cases deployed by December 2024 used existing connectivity solutions (e.g. public mobile networks or private wifi networks), rather than new private 5G networks for their use cases. According to the benefits tracker, two of the 10 5GIR areas had not implemented use cases by March 2025; both these 5GIR projects involve the delivery of private 5G networks. This suggests that the use of existing networks or connectivity services reduced delays to implementation of use cases.

The use cases implemented were spread across a number of sectors including:

- Agriculture: where use cases implemented involved sensors around farms gathering data (e.g. crop growth, animal health and size, temperature, humidity, rainfall, gas concentrations, acidity) and transmitting these data wirelessly to a central point where the data were converted into a live dashboard for actions to be taken
- Water: where use cases implemented involved sensors tracking water abstraction and river flow volume as well as a smart irrigation system using features like soil monitors to allow farmers to effectively manage water application

- Manufacturing including food and drink: where some of the use cases implemented covered the following factors: remote monitoring, predictive maintenance, and real-time data analytics
- Aerospace and engineering: where some of the use cases included improving training and operational efficiency in the sector through the use of extended reality (XR) technologies
- Social care: where use cases implemented tended to focus on Technology Enabled Care (TEC) in different LA areas using TEC devices like smart speakers, sensors, doorbells, bed mats or mobile devices such as smart watches
- Social housing: where use cases implemented focused on features like sensors measuring temperature and humidity to help avoid the build-up of mould and optimising heating and energy consumption
- Ports: where use cases implemented covered sensors to support transport logistics and the efficient operation of port facilities
- Creative industries: where use cases covered virtual productions and a city-centre screen capable of broadcasting 360 degree live content among others

Issues affecting the delivery of 5GIR projects

By the end of March 2025, whilst use cases had been implemented in all but two 5GIR areas, most 5GIR interventions use cases were implemented later than originally planned (as set out in their funding applications). 5GIR areas noted a number of factors that had led to these delays. These included:

- External factors affecting delivery: Most 5GIR areas identified factors that required more time than they had originally accounted for in their project plans. These included operational challenges in live environments and delays due to external dependencies such as weather and shipping (e.g. closure of the Suez Canal leading to delays in deliveries).
- Extra delivery requirements for stackable use cases: Some 5GIR areas noted that stackable use cases enabled more efficient use of 5G infrastructure and supported commercial sustainability. However, they reported that, while such use cases strengthened the business case for connectivity, they also introduced added complexity (e.g. in managing data security and interoperability between applications and systems) which extended delivery times.
- Underestimation of project management requirements: Some 5GIR areas reported that project management capacity was initially underestimated, which had led to delays in delivery. Many 5GIR areas documented the importance of maintaining a regular core project management team with adequate expertise and resources. A few specific aspects related to project management raised by 5GIR areas included:
  - Procurement processes taking longer than expected: Many 5GIR project leads said that their procurement processes took longer than they had originally expected. Some said that the procurement frameworks typically used by LAs were not always suitable for complex procurements like that required for their 5GIR project. Some project leads wondered if, going forward, greater awareness of (on the part of LAs), and access to, relevant pre-existing

procurement frameworks might help with future procurements. Indeed, some 5GIR areas were able to make use of pre-existing CCS frameworks which helped streamline the procurement of certain networks and/or services in their area. Some 5GIR areas said that whilst their procurement had generated many expressions of interest, they had received fewer successful applications due to challenges such as short delivery timelines and bid development skills gaps.

- Nascent nature of 5G market: A few 5GIR project leads highlighted the continuing nascent nature of the market for 5G-enabled (or similar advanced connectivity technology) products and services which they said had slowed down their procurement of both networks and products/services due to it requiring more market engagement than had been originally anticipated. A number of areas highlighted difficulties in matching suppliers with buyers or use case owners through the procurement process.
- Lack of early engagement with stakeholders: In highlighting the lessons learnt from their projects, many 5GIR areas said that early engagement with partners, suppliers, and stakeholders would have better supported the delivery of their projects. For instance, some 5GIR areas noted that earlier engagement with suppliers might have helped validate specific elements of project delivery to enable use cases to be implemented in time for testing and operation.
- Challenges in stakeholder management: Linked to the point above, 5GIR areas noted that once suppliers had been engaged, proactive management of suppliers and subcontractors had helped support delivery. However, engagement with suppliers and other stakeholders had proved more challenging than expected for some 5GIR areas which had difficulty identifying suppliers to work with. Whilst, as noted earlier, DSIT technical advisers had supported this by introducing 5GIR areas to potential suppliers, the fact that this remained a challenge suggests that more time should have been set aside at the start of the project. More time would have allowed 5GIR areas to both identify stakeholders to work with and to work through how delivery of the project would go in order to be well prepared for the actual delivery of their project.
- Ineffective management of use cases: Similarly, many 5GIR areas noted in their lessons learnt that better management of use cases, with clear stakeholder engagement to set expectations and prevent scope creep, was necessary in order to ensure delivery within the funding window.
- Different processes and practices across delivery partners: A number of the 5GIR areas highlighted a lack of standardised internal processes and practices within their project as an issue for delivery. For instance, some 5GIR areas noted that the absence of agreed security policies and procedures for their projects led to fragmented and inconsistent security practices, late integration of security requirements, and additional time needed for redesign and governance. Some 5GIR areas also stated that delays in understanding data protection requirements relating to their projects had created risks of missing design elements and stakeholder misalignment. In addition, many 5GIR areas noted the need for a structured and workable approach to data

sharing across their project with delivery partners and the use of platforms such as SharePoint; these 5GIR areas reported that security constraints within LAs often limited access to, and sharing of, critical data with delivery partners, reducing flexibility and potentially affecting the quality of final deliverables. Some 5GIR areas noted that variability in available funding mechanisms across organisations involved in individual 5GIR projects created challenges in aligning financial planning and resources. That is, some 5GIR areas found that providing funding/resources to certain delivery partners/organisations took more time than they had expected, leading to delays or limitations in some components of project delivery. In general, 5GIR areas said that greater standardisation of processes and practices within their projects from the start would have supported delivery.

Evidence from the network provider and use case stakeholders surveys supports the challenging nature of 5GIR projects' delivery timelines. Appendix 2 sets out more detail on the results from the two surveys. The surveys show that, whilst a high proportion of both network and use case stakeholders that responded to the survey found the requirements of the procurement carried out by 5GIR areas clear and reasonable[22], only a minority felt the timescale for delivery was reasonable[23]. Moreover, the majority of respondents to the two surveys tended to agree or strongly agreed that they had experienced challenges in the delivery of the 5GIR project[24].

3.2.3 Conclusion on whether the delivery of the 5GIR programme went as expected

By March 2025, 119 use cases had been implemented across 5GIR projects – over 80% of 5GIR areas' original plans for at least 144 use cases. Most of the early use cases deployed used existing connectivity solutions (e.g. public mobile networks or private wifi networks) rather than new private 5G networks for their interventions. Two 5GIR areas had not implemented use cases by March 2025 and both these 5GIR projects involved the delivery of private 5G networks. This suggests that the use of existing networks or connectivity services reduced delays to implementation of use cases.

The relatively short timeframe for the programme was the most significant factor impacting on 5GIR areas' ability to deliver realised benefits from use cases. Indeed, most 5GIR areas found the delivery of their projects within the original timelines of the programme challenging, with delivery delayed when compared to original expectations/delivery plans. A range of factors were cited as being responsible for delays across 5GIR areas and across different types of intervention such that there was no single common reason for delays.

Nevertheless, whilst some factors impacting on delivery were undoubtedly outside the control of 5GIR areas (e.g. disruption to the delivery of products through disruption in the Suez Canal), a common finding across 5GIR areas was that many

[22] Nine out of the 13 network providers and 80% of use case stakeholders that responded to the surveys tended to agree or strongly agreed that the requirements set out in procurements were both clear and reasonable.
[23] Four of the 13 network providers and 44% of use case stakeholders that responded to the surveys tended to agree or strongly agreed that the timescale for delivery of the network services was reasonable.
[24] Eight out of the 11 network providers and 55% of use case stakeholders tended to agree or strongly agreed that they had experienced challenges in the delivery.

of the factors affecting delivery could have been foreseen. Better project management of interventions from the start of projects might have reduced at least some of the delays experienced in the delivery of projects. For instance, 5GIR areas might have expected that bringing together lots of different stakeholders to deliver the projects would be time-consuming and likely involve dealing with different organisation-specific processes and procedures – and therefore should have allowed more time for these processes (e.g. procurement) and scaled their plans more effectively to the time available at the point of application. One explanation for 5GIR areas not building sufficient time for delivery into their original plans or scaling back their ambition, is their desire to win funding for the programme through the initial competitive bidding process. Indeed, in the interviews, at least two 5GIR areas reflected that they had, perhaps, been too optimistic in their initial application in terms of delivery.

Another notable factor that impacted on the delivery of 5GIR projects was DSIT's support for project delivery – particularly technical support. All 5GIR project leads highlighted the positive role that DSIT support (particularly technical support) had on the delivery of their projects.

Therefore, in answer to the research question, the delivery of 5GIR projects has been delayed compared to what was originally expected (from 5GIR areas' initial plans). This is, in part, due to issues encountered by 5GIR areas during delivery and probably, in part, due to the optimistic nature of some 5GIR areas' original plans.

3.3 Finding: Whether the spreading of knowledge outside the intervention areas worked as expected

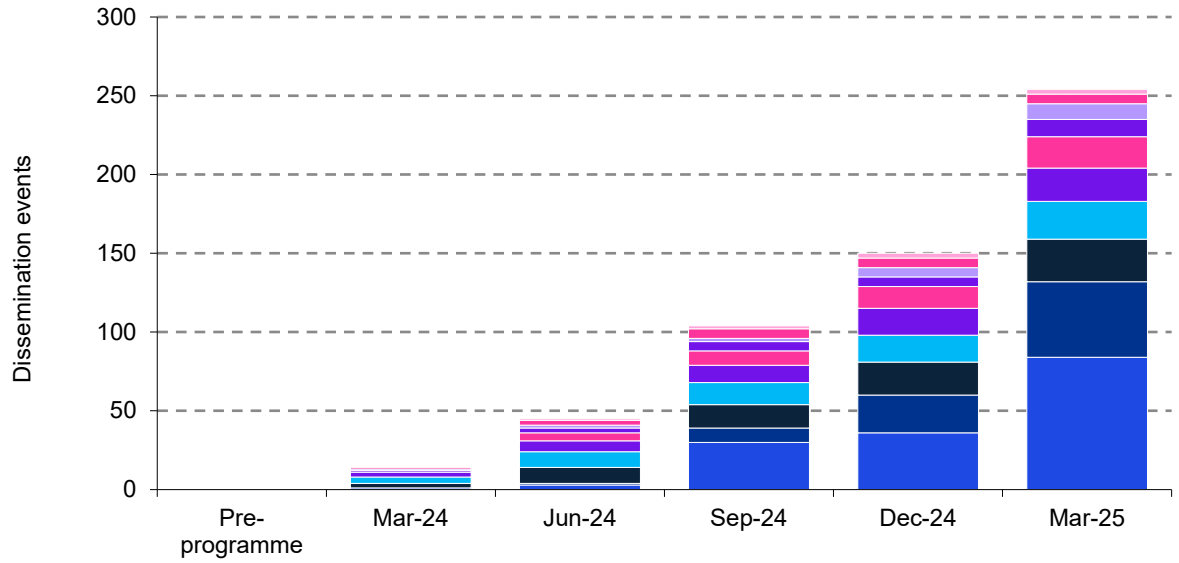
3.3.1 Introduction

As set out in the initial guidance, and following the delivery of use cases, 5GIR projects were to work with DSIT and ecosystem partners, to plan, support and deliver communications activities in order to share the benefits of their work and learnings as widely as possible. As illustrated in the ToC, this sharing of knowledge was expected to lead to a wider understanding of the benefits from the adoption of advanced connectivity networks and services and so, ultimately, drive greater adoption, commercial investment and growth. This section considers the evidence of the spreading of knowledge outside the intervention area drawing on information taken from the benefits trackers, sector deployment reports and interviews.

3.3.2 Evidence on the spreading of knowledge outside the intervention areas

Data on the number of dissemination events recorded over time from the benefits tracker, provides evidence of dissemination activity up to March 2025. Figure 3.2 below illustrates that 5GIR areas recorded being involved in just over 250 dissemination events in the period to March 2025.

Figure 3.2: Total number of dissemination events recorded by the 5GIR programme over time (split by anonymised 5GIR project with each colour representing a separate area)



Source: KPMG analysis based on 5GIR benefits tracker data

Whilst this indicates a large number of events, the distribution of events across projects shown in the chart illustrates that dissemination activity has varied across 5GIR areas. The number of dissemination events in which 5GIR areas had been involved by March 2025 ranges from a low of three events up to 84 events. As shown in the chart, two 5GIR areas account for over half of all dissemination events recorded. This reflects both the nature of the 5GIR projects (e.g. the number of stakeholders involved) as well as the stage of delivery that the intervention was at by March 2025. Indeed, the 5GIR project registering the most dissemination events was also the project that had deployed the most use cases by March 2025. Whilst data from the benefits tracker was not available on the split of events by type, some of the types of dissemination events mentioned by 5GIR areas include: internal meetings; working groups; workshops; launch events, demonstration days, and showcases (relating to the use cases); as well as presentations at UKTIN events[25].

In the interviews, most 5GIR project leads said that most of the dissemination activity and sharing of knowledge, during the period to March 2025 had been within the 5GIR area; the dissemination of knowledge outside the intervention area had been limited given the early stage of many projects.

One of the main routes through which information about 5GIR areas had, by March 2025, been disseminated outside of intervention areas was through 5GIR areas presenting at UKTIN meetings or events. Officials from UKTIN said that its regular monthly meetings were good forums to achieve the spreading of knowledge outside the 5GIR intervention areas. UKTIN officials said that such meetings achieved attendance of between 40 and 50 organisations depending on the topic being

[25] It should be noted that some of the UKTIN events registered in the benefits tracker were attended (and presented at) by a number of 5GIR areas so the same event may be counted a number of times in the total figure for dissemination events.

considered at the meeting. UKTIN officials said they achieved diverse participation across public sector, private sector and academia which provided the potential for findings from 5GIR areas to reach a wide audience. At least eight of the 10 5GIR areas stated, either in interviews or through documentation in the benefits tracker, that they had presented early findings from their project at UKTIN meetings or events. As well as presenting at UKTIN's regular regional and cluster meetings, some 5GIR areas noted presenting at other events including 'The Role of Connectivity in Digitalising Public Services for Growth' and 'UKTIN Connected Reflections Live'.

DSIT officials recognised that, to date, most dissemination events conducted by 5GIR areas had either been internal, or with stakeholders already engaged in 5GIR (or related) interventions. To be effective, officials said that dissemination events needed to reach those who were uninitiated, unaware, or unconvinced by connectivity services and related use cases. However, reaching such stakeholders was recognised by DSIT officials as being difficult and, given the timing of the programme and the relative lack of realised benefits to date, DSIT officials felt it was questionable whether such stakeholders would be convinced by the value of connectivity services and use cases at this point. DSIT officials felt there was a need for more compelling, stronger business cases before wider dissemination would be able to convince new audiences of the value of advanced wireless technology. Section 5 considers this issue, of effectively targeting stakeholders for dissemination, in more detail.

3.3.3 Conclusion on whether the spreading of knowledge outside the intervention areas worked as expected

The spreading of knowledge outside 5GIR interventions was limited in the period to the end of March 2025 given the early stage of benefits realisation. However, all 5GIR projects are monitoring the benefits derived from their projects and the majority had presented at UKTIN meetings or events which will have helped spread some emerging findings and knowledge regarding the benefits from advanced connectivity networks and services to those attending UKTIN meetings/events.

As more benefits materialise over the year ahead, and as 5GIR areas document such benefits, there will be more opportunity for 5GIR areas to spread knowledge outside their intervention areas.

3.4 Finding: Whether the funding of the programme influenced its delivery and effectiveness

3.4.1 Introduction

The initial 5GIR application guidance set out that funding would be provided to LAs in England and Wales via a non-ring fenced capital grant under Section 31 of the Local Government Act 2003; and for LAs in Scotland and Northern Ireland via a capital grant under Section 8 of the Industrial Development Act 1982. The guidance also noted that whilst applicants awarded grants under the Industrial Development Act would be expected to sign a Grant Funding Agreement with DSIT – DSIT would

ensure those applicants did not incur a higher burden than applicants funded under the Local Government Act.

The original 5GIR business case set out the reasoning for using this funding approach which included providing LAs with increased flexibility and freedom to devise and deliver their plans.[26] This funding approach was preferred to the more traditional method of funding where those delivering the project spend funds in line with a Grant Funding Agreement (usually legally binding) and then claim the spend back from the funding body. The original 5GIR business case was also clear that adopting this funding mechanism for the 5GIR programme meant that DSIT would have less control over grant recipients (when compared to more traditional funding methods).

This section considers the extent to which the funding of the programme influenced its delivery. It considers the impact of the funding method on the efficiency and flexibility of delivery as well as how LA financial processes align with the funding method used. These topics were the main areas identified through the evidence drawn from interviews with 5GIR areas and DSIT officials.

3.4.2 Evidence on whether the funding of the programme influenced its delivery and effectiveness

3.4.2.1 Efficiency in delivery of projects/programme

All 5GIR project leads were positive about the impact of the funding mechanism on delivery. Most 5GIR project leads stated that the funding model used for the 5GIR programme enabled faster decision making around procurement and implementation of their project when compared to what would have occurred with the more traditional funding methods. They said that having the funding available upfront – in a way that didn't happen with traditional funding models - made it much easier and quicker to go through LA finance/procurement processes when compared to more traditional methods. With more traditional methods for funding, goods and services would need to be purchased before claiming back the spend – thus involving more risk for LAs with project leads needing to convince finance and procurement officials that the funds would be repaid which could cause delays. The traditional funding mechanism was seen as being far more burdensome and time-consuming than the funding mechanism used for 5GIR.

DSIT officials also felt the funding mechanism used for the 5GIR programme had a very positive impact on the delivery of the programme. First, DSIT officials felt that the funding mechanism had made the programme attractive to potential applicants and had resulted in a high number of applications (36 in total – which exceeded DSIT's original expectations)[27] than would otherwise been the case. Second, DSIT officials highlighted that the 'lighter touch' approach enabled areas to focus on delivery rather than expending resource servicing DSIT funding requirements (see Section 3.4.2.3 for LAs views on this approach).

[26] 5G Innovation Regions (5GIR) Hybrid Outline/Full Business Case, approved (with conditions) on 20/07/2023
[27] KPMG, 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Process evaluation report (application process), October 2024

3.4.2.2 Flexibility in delivery of projects

In the interviews, 5GIR project leads said that the funding method enabled more streamlined decision-making by delivery teams. For instance, the funding mechanism provided flexibility in reallocating funding between different parts of a project to allow for changes/lessons learnt during the delivery of the project. 5GIR project leads felt that instituting such changes would have been much more burdensome with a more traditional funding mechanism - likely requiring the need for a change control process or similar which would significantly add to delays and the general delivery burden for LAs.

DSIT noted that by providing projects with the funding up-front this allowed 5GIR areas to flex their projects in response to developments. However, DSIT officials also noted that one potential drawback of the funding mechanism was that once funded, DSIT had fewer levers with which to direct or influence the delivery of projects in the event of any problems arising. DSIT officials said this risk had been considered at the programme planning stage but that they did not recall instances where this had proved a problem in the delivery up to March 2025. Officials considered that the advantages of the funding approach used for 5GIR, coupled with the fact that LAs have similar levels of scrutiny of public spending as for central government (see below for more details), far outweighed those of using a different funding model.

3.4.2.3 LA financial processes

A number of 5GIR project leads made the point, in the interviews, that the funding approach adopted aligned well with existing LA financial procedures. They stated that, as public bodies, LAs had to account for public spending in a transparent and responsible way; something DSIT officials also recognised. 5GIR project leads felt that many of the financial processes that DSIT might otherwise have insisted on (in the way traditional funding mechanisms worked) would simply duplicate processes with no real added value. As a result, the funding mechanism employed in the 5GIR programme was considered by LAs to have minimised duplication of financial processes and, therefore, the burden on LAs administering the projects. Moreover, 5GIR project leads felt that the fact LAs had to go through their own financial processes should have provided DSIT with confidence regarding the responsible and effective use of public funds; DSIT officials agreed with this view.

3.4.3 Conclusion on whether the funding of the programme influenced its delivery and effectiveness

The funding mechanism was considered by programme stakeholders to have had a positive influence on the delivery and effectiveness of the 5GIR programme over and above what would have happened with a more traditional funding model.

The previous process evaluation of the application process[28] found that over a third of applicants to the 5GIR programme (that responded to the survey conducted for that evaluation) agreed that the method of funding was an important factor in their decision to apply for the programme; confirmed in interviews with a number of 5GIR

[28] KPMG, 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Process evaluation report (application process), October 2024

areas. This suggests that – as also stated by DSIT officials – the programme received more applications than it would have done a more traditional funding model had been used.

In terms of delivery, the provision of up-front funding made decision making within LAs faster and more straight-forward than would have been the case with a more traditional funding method. For example, having the funding provided up-front, enabled 5GIR areas to be flexible in delivery, changing plans in response to developments rather than having to stick to out-dated plans or to go through time-consuming change control procedures in order to change delivery plans. This suggests that the delivery of 5GIR projects might have taken longer, or not been as effective, if a more traditional funding model had been used.

Whilst the funding model used for the 5GIR programme provided DSIT with less control than would have been the case with a more traditional funding model, DSIT has not reported any problems in this respect. In part this might be because 5GIR areas set out in their applications what they intended to deliver and to a large extent these intentions were made public. 5GIR areas were, therefore, open to interrogation by external parties as to whether they had delivered what they said they would with public funds. Given the 5GIR projects were led by LAs, such interrogation could be wide-ranging, potentially including political interest as well as interest from industry stakeholders. This external pressure might have helped focus 5GIR areas on delivering what they originally said they would deliver. Moreover, the technical support provided by DSIT officials meant that throughout the individual projects' delivery DSIT, through the technical advisers, were able to influence projects and support their effective delivery. It is clear from the interviews that 5GIR areas valued this support for their projects.

Finally, by channelling funding through LAs who have financial processes which require transparency and responsibility in public spending, financial integrity of spending has been upheld within the programme without the need to duplicate fiscal processes.

3.5 Finding: Whether there was anything that could have been improved with respect to the design and/or delivery of the programme

3.5.1 Introduction

This section considers whether, as a result of the analysis conducted as part of the process evaluation, there is anything that could have been improved with respect to the design and delivery of the programme. The section considers the main areas identified for potential improvements which were:

- The original application guidance
- The reporting requirements for the programme
- Better forward planning by LAs

3.5.2 Evidence on areas that could have been improved with respect to the design and delivery of the programme

3.5.2.1 Application guidance

Capital versus revenue funding

In the interviews, some 5GIR project leads said that the initial guidance provided by DSIT was not clear on the capital vs revenue nature of funding. Project leads felt this was particularly relevant regarding LAs' capacity to deliver projects of this scale and nature. That is, a number of project leads felt it would be useful for the guidance to be explicit that some of the funding could be used for revenue purposes e.g. to fund project management office (PMO) costs experienced by the LAs.

DSIT officials highlighted that the initial guidance was clear on the capital, and research and development (R&D), nature of the funding. Officials also highlighted that more guidance on the nature of funding was provided through the clarification question process.

The application guidance is clear that the grant should be, "… treated as capital expenditure in line with UK GAAP". In the published clarification questions, DSIT stated that LAs should, "… take their own view on what is capitalisable or otherwise under UK Generally Accepted Accounting Practice (UK GAAP), and according to their own accounting policies". Answers to the clarification questions on this point also provided a link to HM Treasury guidance on the approach to capitalisation and R&D capitalisation under ESA10. That HM Treasury guidance highlights that the cost of staff (including PMO) that "solely (or mostly) provide support for running R&D programmes" could be included as a capital cost.

Therefore, whilst applicants were provided with the information with which to understand the nature of the grant funding available for the 5GIR programme, DSIT might want to consider whether clearer guidance in this respect might encourage: i) more applications (e.g. from organisations that assume such capital funding cannot be used for PMO costs); and, ii) more effective set up and subsequent delivery by successful applicants.

Expectations for procurement

In the interview, DSIT officials said that the application process could have included better guidance around how 5GIR projects might best procure their projects. Officials identified that some 5GIR areas had procured a service based on, or requiring, advanced connectivity but without getting into, unnecessary, technical detail (i.e. focussing on the service required – not the technical detail of how that service was to be provided). This was the approach which DSIT felt was most effective for applicants to the programme to adopt.

However, some 5GIR areas had procured their project in a much more technical fashion – defining the particular connectivity services and use cases to be used and consequently requiring a lot of detailed, technical, information as well as time to procure. DSIT officials noted that this approach, because of its detailed nature, often

required the use of consultants (because the technical knowledge and capability did not exist within LAs). In addition, DSIT officials noted that the technical specifications often had to be revisited and revised because they did not align with the connectivity/solution providers' expectations of what could be provided. Both the use of consultants to devise such technical specifications together with the time taken to revisit and revise them used resources that might otherwise have been used for the delivery of services.

3.5.2.2 Reporting requirements

In the interviews, whilst for the most part 5GIR project leads stated that the 5GIR programme reporting requirements were proportionate and not overly burdensome, some felt there were things that could be improved. A small number of project leads said that they felt there was some duplication in the reporting required between DSIT and UKTIN; they felt this was inefficient. Similarly, a small number questioned the value of the benefits tracker. Lastly, some project leads questioned whether there could have been more dissemination and learning delivered from the reporting across the programme, enabling more value to have been gained from the information that was provided to DSIT/UKTIN. More specifically, 5GIR areas said that learnings that different areas had derived through the delivery of their projects might have helped other projects with the delivery of their own projects.

DSIT officials said that the 5GIR programme was more explicitly outcomes-focused than some other programmes. Officials said that their experience of the 5GIR programme had provided them with factors to consider around the reporting requirements for future similar advanced connectivity adoption programmes. For instance, for any future similar adoption programmes, there might be a greater focus on how outcomes were being delivered rather than on the specific activities to support the realisation of those outcomes.

3.5.2.3 Better forward planning by LAs

In terms of the delivery of individual 5GIR projects, information drawn from the benefits trackers and sector deployment reports as well as the interviews with 5GIR areas, suggest that the delivery of individual 5GIR projects would have benefited from more up-front planning. Specific points raised in connection with this included:

- More time for forward planning: Many 5GIR areas highlighted the need to provide time for discovery and scoping as well as early development of concept designs in order to reduce delivery risks with their projects. These 5GIR areas reported that incomplete planning at the outset made it harder to manage dependencies, increased commercial and legal risks, and led to design changes during delivery. Many 5GIR areas said that such forward planning would help develop more realistic expectations for projects (including a clear understanding of use cases).
- Greater consideration of factors affecting delivery: In line with the need for more time to forward plan projects, many 5GIR areas highlighted specific issues that with earlier consideration might have helped the delivery of their projects. These issues included: compatibility of solution with existing infrastructure; comprehensive site surveys before installation; time for planning applications;

and data protection impact assessments (DPIA) and associated GDPR considerations.

— Procurement and due diligence: As noted earlier (see Section 3.2.2.2), many 5GIR areas experienced difficulties in their procurement. A lesson identified by LAs related to this was that the procurement process should not be rushed, suggesting compressed timescales had contributed to issues experienced. In particular, many 5GIR areas highlighted the importance of thorough due diligence on supplier capability during the procurement process. In relation to this, two 5GIR areas specifically mentioned the need for suppliers to have Code Powers[29] to expediate planning permissions (i.e. requesting that suppliers have such powers in the procurement process would support efficient delivery of the project).

These points are similar in nature to the underestimation of project management requirements highlighted earlier (see Section 3.2.2.2). It is appropriate for DSIT to expect 5GIR projects to meet the commitments outlined in their applications. However, feedback from projects leads suggests that incorporating a clear expectation for effective project management capacity in the initial guidance may improve delivery across funded projects. This is also linked to the earlier point about funding and, being clear that the nature of this capital funding does not preclude the resourcing of dedicated project management support.

3.5.3 Conclusion on things that could have been improved with respect to the design and/or delivery of the programme

The fact that a number of 5GIR areas raised the issue of the nature of the funding available through the 5GIR programme and what it could be used for suggests that there was room for clearer guidance on this topic. Providing more clarity around this issue, for future programmes for instance, is in DSITs interests because it may lead to an even greater number of applications as well as enabling projects to provide sufficient resource for project management capabilities from the outset - supporting the more effective set up and subsequent delivery of successful projects.

As noted earlier in Section 3.2.2.2, some 5GIR areas felt they had underestimated project management requirements. Whilst DSIT might expect applicants to understand the value of effective project management, including from the start of projects, an explicit expectation in the initial guidance that applications should include effective project management capacity from the start of projects might have focused 5GIR projects on this requirement. Clearer guidance on the use of 5GIR funding for project management purposes might also have helped some 5GIR project areas devote more resource to project management capabilities, particularly

[29] Code powers refer to the statutory rights granted to communications providers under the Electronic Communications Code (ECC) in the UK. These powers allow operators to install and maintain infrastructure, like cables and equipment, on both public and private land, facilitating the development of electronic communications networks.

at the initial stages of project development. Both factors might have helped some 5GIR projects prepare for the delivery of their projects more effectively.

3.6 Conclusions on the interim process evaluation research questions

The overarching research question for the process evaluation is: What went well and what could be improved with regard to the 5GIR programme, specifically in relation to the design and delivery (from both a DSIT and local authority (LA)/partner organisation perspective)?

As shown in Section 3.2.2.1, 119 use cases had been implemented by March 2025 (compared to original plans for at least 144 use cases to be implemented according to initial applications); all but two 5GIR areas had implemented use cases by March 2025. However, most 5GIR areas found the delivery of their projects within the original timelines of the programme challenging, with delivery delayed when compared to original expectations/delivery plans. This was, in part, due to issues encountered by 5GIR areas during delivery and probably, in part, due to the optimistic nature of some 5GIR areas' original plans.

Just over 250 dissemination events relating to the projects had taken place. Whilst the benefits trackers did not provide consistent data on the type of event and the number of attendees at each event it showed that two 5GIR areas accounted for most of this dissemination and that most dissemination had taken place within, rather than outside, the 5GIR area.

DSIT's support, particularly technical support, has been cited in the successful implementation of use cases for 5GIR projects. In addition, the funding mechanism is reported to have had a positive influence on the delivery of individual 5GIR projects, as well as the programme as a whole. Its incorporation into the design of the programme is reported to have led to more applications than would have been the case with a more traditional method of funding. This will have supported the achievement of the 5GIR programme's original objectives in terms of geographic and sector coverage (as set out in the original business case to the programme[30]). The funding mechanism adopted for the programme is also reported to have supported the delivery of 5GIR projects both through reducing the time required for decisions relating to projects to be taken and by enabling delivery teams to be more flexible in the delivery of projects when compared to more traditional funding models.

In terms of areas for improvement, the main areas include:

- Application guidance:
  - The guidance could have been clearer on the nature of 5GIR funding and for what purposes it could be used. More clarity might have enabled some 5GIR projects to provide sufficient resource for project management capabilities from the start of the project supporting more effective delivery of some 5GIR projects.

[30] 5G Innovation Regions (5GIR) Hybrid Outline/Full Business Case approved with conditions 20/07/2023

  - The guidance could have been more explicit about how applicants might procure their services (so as to reduce the requirement for consultants or other third parties).
- Reporting requirements as between DSIT and UKTIN should be streamlined. Some 5GIR areas said there was some duplication across DSIT and UKTIN requests.
- More timely payment of grants to some 5GIR areas would have better supported the delivery of some 5GIR projects.

4 Findings of the interim impact evaluation

4.1 Introduction

As noted earlier, the strategic objectives of the 5GIR programme are to:

- Drive economic growth across the UK by supporting places to adopt advanced wireless technologies for services based around local opportunities for growth
- Accelerate commercial investment in 5G and other advanced wireless technologies by aggregating and demonstrating demand
- Foster the 5G ecosystem

Section 2 set out how this evaluation seeks to answer the question of the extent to which, by the end of March 2025, the programme can be said to have achieved these objectives. To support this consideration, this section seeks to answer the impact evaluation research questions which are repeated below.

Evaluation research questions for the interim impact evaluation

To what extent did the 5GIR programme achieve the outcomes it set out to achieve within the timescale of the interim evaluation and to what extent can these outcomes be attributed to the programme – specifically:

- To what extent did the 5GIR interventions provide evidence of the realisable benefits of advanced wireless technologies?
- To what extent were the benefits of advanced wireless technology adoption from the 5GIR programme documented and disseminated?
- To what extent has the 5GIR programme fostered an emergent 5G ecosystem?
- To what extent were the 5GIR interventions sustainable post-Government funding (i.e. networks continued after funding)?
- To what extent is there evidence of the 5GIR programme encouraging and/or increasing long-term adoption of advanced wireless technology?

Each of the supplementary impact evaluation research questions is considered in the sections that follow, reflecting the outcomes expected to be achieved through the programme within the timescales of the evaluation.

In all cases, CA is applied in order to assess the extent to which the relevant outputs and outcomes have been achieved, the strength of the causal linkages and what other factors could have influenced outcomes.

To support this analysis, each section starts with a summary of the components of the ToC for the 5GIR programme relevant to the evaluation research question being considered. This summarises the relevant activities, outputs and outcomes that are

expected to be delivered in order for the strategic objectives of the programme to be achieved, and the associated causal linkages that the analysis aims to test.

Each section draws on evidence from the benefits trackers and other project/programme documentation, interviews with the 5GIR areas, DSIT officials, UKTIN officials, surveys of use case stakeholders and network providers, as well as wider research and evidence where relevant, to answer the research question and draw conclusions around the impact of the programme.

4.2 Finding: To what extent did the 5GIR interventions provide evidence of the realisable benefits of advanced wireless technologies?

4.2.1 Summary of activities, outputs and outcomes expected from the ToC

The ToC for the 5GIR programme identifies that evidence of realised benefits from advanced wireless technologies is required in order to deliver longer term impacts, including the acceleration of commercial investment in 5G and other advanced wireless technologies and increased economic growth (two of the strategic objectives of the programme)[31].

More specifically, evidence of the realisable benefits from the advanced connectivity networks and services implemented through the 5GIR programme is expected to lead to a general increase in interest and demand for 5G and other advanced wireless technology by business, public sector organisations and other bodies that might benefit from its adoption. This demand, together with the stackable nature of the use cases – meaning a range of use cases and associated benefits can be realised from a common connectivity network or solution – is expected to evidence to network providers the commercial viability of advanced connectivity networks. This, in turn, is expected to lead to an increase in commercial investment by network providers more widely, outside of 5GIR areas.

The accelerated commercial investment, together with the improved connectivity and further adoption of 5G and advanced wireless technology, is expected to support longer-term economic growth. For instance, the increased connectivity is expected to facilitate more uses of advanced wireless technology (e.g. robotics, IoT, Augmented reality (AR)/virtual reality (VR)) and catalyse further adoption by businesses and organisations. The increased adoption of advanced wireless technology is expected to unlock new economic opportunities (through increased productivity, new products and services, new markets and new use cases) and significantly contribute to economic growth.

The ToC for the 5GIR programme shows that, for the programme to have provided evidence of realised benefits being derived from advanced wireless technologies, a number of activities and outputs/outcomes are required. These include:

- 5GIR areas need to have used DSIT funding to develop a plan for procuring and implementing stackable use cases in the intervention area, a team to deliver it,

[31] The other strategic objective around fostering a 5G ecosystem is covered in Section 4.5

including a point of contact, and to have identified and engaged stakeholders in the delivery of use cases.

- 5GIR areas need to implement use cases in their area, which at the programme level cover a range of sectors.
- 5GIR areas need to deliver use case specific outputs and benefits which drive outcomes like improved connectivity, improved welfare and improved productivity for example, leading to wider societal benefits.

Therefore, in answering the research question, evidence of the delivery of these outputs and outcomes and the strength of the causal pathways is assessed in the following section.

4.2.2 Evidence on the extent to which 5GIR areas realised benefits from advanced wireless technologies

4.2.2.1 5GIR areas' plans for advanced wireless technologies

Through their initial applications, all 5GIR areas set out a plan for the delivery of use cases in their area. This included teams to deliver the projects and plans to engage stakeholders. Section 3.2.2 identifies that many 5GIR areas faced issues in the delivery of their projects. Specifically, a number of 5GIR areas noted difficulties in engaging stakeholders in the delivery of their projects, in part due to the nascent nature of the 5G market. Nonetheless, the plans lay the groundwork for subsequent delivery, including identifying partners to support use case delivery (see Section 3.2).

4.2.2.2 Implementation of use cases in 5GIR areas

5GIR areas' initial applications set out what they intended to deliver in regard to their 5GIR intervention with DSIT funding. Data and information from the benefits trackers, interviews and other programme documentation suggest a broad correspondence between the initial applications and what 5GIR areas had implemented, or were due to implement, in terms of use cases. That is, most 5GIR areas had implemented use cases for each sector targeted in their original plans. By March 2025, use cases had been implemented for all sectors originally targeted by the programme.

Indeed, Section 3.2.2 shows that 119 of the originally planned 144 use cases, had been implemented across eight 5GIR areas by March 2025. These use cases included: the deployment of mould sensors in social housing; activity sensors for social care purposes; soil sensors in agricultural settings; traffic sensors in ports; and private 5G networks for some interventions. However, as identified in Section 3.2.2, due to issues faced by 5GIR areas, the delivery of many 5GIR projects were delayed as compared to original plans and expectations, and the majority of use cases were not delivered until the final quarter of the programme. As of March 2025, two areas had not implemented any use cases, however evidence from the benefits trackers and interviews suggested that both areas would implement use cases shortly after March 2025.

Whilst attributing activity and outcomes specifically to the 5GIR programme is challenging without a robust comparison group, in the interviews all 5GIR project

leads reported that their project would not have taken place (and so outputs would not have been achieved) in the timescales of the original programme without DSIT funding. Most said the projects would not have gone ahead at all, whilst some acknowledged that projects, or elements of them, may have gone ahead (e.g. some areas noted they and some local stakeholders had been thinking about how to best use advanced wireless technologies), but that DSIT funding had accelerated spending. This is supported by the fact that LA budgets have decreased in real terms over the past 15 years, meaning funding projects or initiatives like 5GIR will have become increasingly difficult, if not impossible, for LAs whose spending is driven almost entirely by mandatory, high-cost, demand-led services (with councils having little control over that demand). Evidence from wider stakeholders also supports the attribution of activity to the programme, with the majority of respondents to the network provider and use case stakeholder surveys (see Appendix 2 for more details) reporting that without DSIT funding they would not have provided the advanced connectivity network and/or services in the 5GIR area[32]. Together, the evaluation evidence suggests the delivery of these use cases was largely attributable to the programme. However, it is noted that some of the recipients of 5GIR funding were active in developing 5G use cases prior to funding (having been recipients of previous Government programmes such as 5G Testbeds and Trials). Moreover, there are some areas that received 5G Testbeds and Trials funding and have subsequently progressed 5G use cases in the absence of DSIT 5GIR funding, such as Liverpool 5G. This suggests the issue of attribution may not be clear cut, and will be explored further as part of the final evaluation.

4.2.2.3 Delivery of use case specific outputs and benefits

In interviews, very few 5GIR project leads said that quantifiable benefits had been achieved within their projects within the original timescales of the 5GIR programme. Most 5GIR project leads said they had achieved partial delivery of planned outcomes by the original March 2025 deadline in the sense that a lot of the infrastructure had been set up and use cases implemented, though full operation of use cases and the realisation of benefits from them was often incomplete. Most 5GIR project leads said that measuring benefits from use cases would require longer timeframes.

Similarly, at the point of the interview with DSIT officials, officials acknowledged that many benefits from across the projects were yet to be realised and evidenced.

Nevertheless, a number of 5GIR project leads, from interventions where use cases were in delivery, pointed to expected future benefits based on activity and outputs to date. Amongst others these included:

- Potential reductions in social housing repair costs (from the use of sensors such as mould monitors): Early treatment of issues like mould in tenants' flats was expected to be effective in reducing social housing costs. Refurbishment costs were expected to be reduced because early warnings from the mould monitors would allow for early remedial action either on the part of the tenant (e.g. opening windows/improving ventilation) or by the social housing owner (e.g. by carrying

[32] Three of the four network providers and 63% of the use case stakeholders who responded to the survey said it was somewhat or very unlikely that they would have invested in advanced connectivity networks and services/ in the use cases in the 5GIR area.

out smaller repairs earlier than would otherwise have been the case). In addition, temporary accommodation costs were expected to be reduced because these early interventions would reduce the need for tenants to move out of their accommodation whilst more extensive repairs were carried out.

- Potential reductions in social care costs through use of virtual care technology: In these interventions replacing in-person visits with video care calls to cover features like daily contact, support and welfare checks was expected to lead to cost reductions in delivering care services. In addition, a range of other technological support services, like various fall detectors; movement monitors; and smoke detectors for example, are expected to support individuals in their homes (helping to delay individuals' entry to care homes and saving associated costs).
- Potential savings (financial and environmental) from more effective ammonia management in poultry farming: Lower ammonia emissions had been found to improve feed conversion within birds as well as deliver better environmental outcomes – incentivising both farmers and LAs/environmental bodies to encourage better ammonia management on farms.

Consistent with these benefits anticipated by 5GIR areas, DSIT officials reported that a number of projects were expected to realise benefits that would enable clear and robust business cases to be developed for multiple advanced wireless technology uses.

4.2.3 Conclusion on the extent to which 5GIR interventions provided evidence of the realisable benefits of advanced wireless technologies

Whilst by March 2025, very few 5GIR areas had realised benefits from their use cases, the majority of planned use cases had been implemented with further implementation planned. These use cases covered a range of sectors, in line with programme objectives, and in many cases 5GIR areas were able to clearly articulate how expected benefits would be delivered.

This provides confidence that, in time, the 5GIR interventions will deliver use case benefits within the 5GIR areas – thus providing evidence of the realisable benefits of advanced wireless technologies. Indeed, the evaluation identifies that, with the extension period, 5GIR project leads expect stronger evidence of realised benefits given the increased time for use cases to operate, as well as through implementing more use cases from which benefits can be realised in the year ahead.

Whilst attributing activity and outcomes specifically to the 5GIR programme is challenging, in the interviews all 5GIR project leads reported that their project would not have taken place in the timescales of the original programme without DSIT funding. Moreover, the majority of respondents to the network provider and use case stakeholder surveys (see Appendix 2 for more details) reported that without DSIT funding they would not have provided the advanced connectivity network and/or

services in the 5GIR area[33]. However, the issue of attribution is difficult and will be explored further as part of the final evaluation.

4.3 Finding: To what extent were the benefits of advanced wireless technology adoption from the 5GIR programme documented and disseminated?

4.3.1 Summary of activities, outputs and outcomes expected from the ToC

The ToC for the 5GIR programme identifies that to deliver the three strategic objectives of the programme (accelerating commercial investment, increased economic growth and fostering a 5G ecosystem), 5GIR interventions need to have documented and disseminated the benefits of advanced wireless technologies. Such documentation and dissemination is expected to improve the understanding of these benefits among organisations that might be interested in adopting advanced wireless technology (both those involved in the projects and those not). This is assumed to lead to more demand for access to advanced wireless networks by potential organisations interested in procuring use cases. In addition, it is expected to improve the understanding among network, or other advanced wireless technology, providers as to the benefits and opportunities that can be derived from the adoption of 5G and other wireless technologies. With this increased understanding, it is assumed that network operators will be more inclined and/or more confident to accelerate commercial investment in advanced wireless technology.

The ToC shows that for the programme to have documented and disseminated the benefits of advanced wireless technology adoption a number of activities and outputs/outcomes are required. These include:

- Once implemented, use cases are monitored and evidence of the individual and cumulative benefits realised from use cases is documented. This is expected to provide evidence of the impact of use cases which should help organisations develop stronger business cases for future investment in advanced connectivity networks and/or funding of advanced connectivity services.
- Dissemination through publication of documents and wider knowledge sharing activity covering both the benefits realised from use cases as well as the lessons learnt from the delivery of projects. This should include sharing across 5GIR areas and, with the support of UKTIN, across areas outside the intervention area. This should help increase awareness and understanding of the benefits from the adoption of advanced connectivity networks and services as well as the practicalities of their delivery, and is assumed to lead to increased demand for advanced wireless technology and more investment both within and outside of intervention areas.

In answering this research question, evidence of the delivery of these outputs and outcomes and the strength of the causal pathways is assessed.

[33] Three of the four network providers and 63% of the use case stakeholders who responded to the survey said it was somewhat or very unlikely that they would have invested in advanced connectivity networks and services/ in the use cases in the 5GIR area in the absence of DSIT funding.

4.3.2 Evidence on the documentation and dissemination of the benefits of advanced wireless technology adoption

4.3.2.1 Monitoring and documenting of the benefits and lessons learned from 5GIR projects

All 5GIR areas monitored their projects and reported progress to DSIT on a quarterly basis through the benefits tracker. Via the tracker, they collected information and data related to the delivery of the project including: the number of use cases implemented; value of alternative funding generated by the project; number of firms engaged in the project; and lessons learnt, amongst other things. As such, the benefits tracker is a useful record of the activities and outputs derived from the funding provided by DSIT for the 5GIR programme.

However, by March 2025 the benefits tracker had not been used by most 5GIR areas to track the benefits realised from individual use cases. Similarly, the sector deployment reports produced by 5GIR areas after March 2025 did not include the level of detail on realised benefits necessary for an effective business case to be developed and 5GIR areas had not produced any additional documentation relating to the delivery of benefits from their project. Outside of the benefits trackers and sector deployment reports, the main documentation produced during this period related to specifications for the procurement of advanced connectivity networks and services (relating to the delivery of 5GIR projects) and documents or communications advertising the existence of 5GIR projects. A number of 5GIR project leads said that the documentation of benefits from their projects had been limited given the early stage of many projects by March 2025. In line with this, DSIT officials said that the documentation of the benefits of advanced wireless technology varied across projects.

Based on the ToC for the programme, more detailed documentation will need to be provided in the extension period of the programme to allow for future dissemination and thus, support wider adoption of advanced wireless technology. For potential adopters this will mean detailed information on the benefits realised from the individual use cases deployed – ideally both monetary benefits as well as non-monetary benefits (e.g. wider public benefits – suitably valued - that might derive from individual use cases like improved environmental outcomes for instance). For network providers this will mean detailed information on the potential aggregation of benefits from a range of use cases deployed on a single connectivity solution to provide an understanding of the total benefits that are achievable from an individual connectivity solution. In addition, for both potential adopters and network providers, detailed information on the costs of the advanced connectivity solutions used (both in terms of capital costs and on-going revenue costs) will also be required in order to fully evaluate the benefits as compared to the costs of each individual use case. This documentation is expected to improve the understanding of the benefits of advanced connectivity adoption among organisations that might be interested in adopting such technology (both those involved in the projects and those not) as well as among network, or other advanced wireless technology, providers. This increased understanding is assumed to make organisations more inclined to adopt advanced connectivity solutions and network operators more confident to accelerate commercial investment in advanced wireless technology. As a result, the

documentation will need to provide detailed information from which both potential adopters of advanced connectivity services and network providers can assess the value of advanced connectivity services.

4.3.2.2 Dissemination

Section 3.3 shows that 5GIR areas had delivered over 250 dissemination events in the period to March 2025. This was largely concentrated within two 5GIR areas which accounted for over half of the events. In interviews, most 5GIR project leads reported that they did not want to expend resources on dissemination without being able to illustrate realised benefits and instead saw both documentation and dissemination as a key part of their activities during the extension period, indicating dissemination activity will increase over the remainder of the programme. Nonetheless, 5GIR project leads highlighted that there had been some successful sharing of knowledge and learning between organisations within the same sector (e.g. between ports) or within a region.

DSIT officials reported that, in most instances dissemination events that had happened in the period to March 2025 had taken place either with internal stakeholders (i.e. internal to the project) or with stakeholders who are already convinced of the value of, or involved in, advanced wireless technologies. This could limit their effectiveness in driving wider awareness and adoption of advanced wireless technologies.

DSIT officials recognised that it was not easy to reach those stakeholders who are not aware of or interested in the opportunities of advanced wireless technology, but may hold key decision making roles – for instance those in charge of renewing contracts for services. Officials stated that documentation of compelling business cases to support various advanced wireless technology uses was necessary for effective dissemination and influencing of stakeholders who are either unaware or unconvinced of the benefits of advanced wireless technology. This has not yet been delivered by 5GIR areas, as it is dependent on robust evidence of benefits realised from use cases, which areas had not yet collected.

Whilst dissemination activity outside of 5GIR areas had been limited, this activity is expected to be supported by UKTIN going forward. In the interview, officials from UKTIN reported that they had created a library of case studies from 5G programmes on its website which outlined, for various sectors, the problem to be solved, a description of the solution, a summary of the commercial model, the benefits that could be expected to be realised and lessons learnt from real-world deployments. Documentation from 5GIR use cases would be added and then findings shared through various routes including the online documentation library, direct presentations and knowledge sharing events, industry conferences and events and sector-specific panels and working groups. As a result, although not delivered to date, there is evidence to suggest that through the publication of 5GIR projects' documentation on UKTIN's website, the findings from use cases implemented by 5GIR areas will be available to organisations outside 5GIR areas.

In terms of broader dissemination beyond the LA's own activity, project leads were generally unaware of how much dissemination industry partners, like MNOs for example, were doing for their own benefit, but did believe some activity in this area was happening. In addition, three 5GIR areas registered academic articles that had been published as a result of 5GIR activities during the period to March 2025.

Given documentation and dissemination activity has been directly linked to the learnings from the programme, and has been funded by the programme, this activity is considered to be directly attributable to the programme. To the extent that some project activity may have happened to some degree without the programme, there may have been some subsequent knowledge sharing from this, particularly within 5GIR areas, however any wider dissemination (including forthcoming activity) would have been unlikely to occur given the limited incentives for them to do so outside of the programme.

Notwithstanding the value of documentation and dissemination activity by LAs, DSIT officials felt that the most compelling form of dissemination would come from the adoption of advanced connectivity networks and services used in the 5GIR programme by the private sector, based on their commercial considerations, rather than necessarily from documentation provided by LAs. For instance, organisations buying or investing in advanced connectivity networks or services (i.e. evidencing the value of advanced connectivity networks and services through purchasing them or investing in them) would best evidence the value of such technology. Progress towards this is considered in Section 4.6.2.

4.3.3 Conclusion on the extent to which the benefits of advanced wireless technology adoption from the 5GIR programme was documented and disseminated?

All 5GIR areas are monitoring their projects through the benefits tracker. However, the documentation of benefits realised from use cases had been limited in the period to March 2025, given most areas had only just implemented use cases by that point.

Whilst a relatively large number of dissemination events had been delivered as part of the 5GIR programme, most of these events had been focused on the individual 5GIR area itself, rather than wider dissemination outside the intervention area. Moreover, most 5GIR areas said they had devoted limited resources to documentation and dissemination activities given the relatively early stage of use case implementation (and so lack of realised benefits). Given the direct link to the programme learnings, and limited incentives to conduct dissemination activities without it being a requirement of the programme, the documentation and dissemination activity that has occurred is considered to be largely attributed to the programme.

Over the next year or so, in order for the end impacts of more commercial investment and increased economic growth to be achieved, the ToC requires realised benefits to be delivered from use cases (either from those recently implemented, or planned), and for 5GIR to subsequently deliver on their stated intention to increase dissemination activity, including beyond their own 5GIR areas.

Based on the evaluation evidence, a key focus of this should be on identifying and reaching those that are not aware or less interested in advanced wireless technologies, including through collecting robust evidence of realised benefits and using this to develop compelling business cases for investment and through working with UKTIN to widen reach. This, in turn, should help increase the understanding among other organisations in the area and outside as well as the wider sector of the benefits of 5G and associated connectivity services.

4.4 Finding: To what extent has the 5GIR programme fostered an emergent 5G ecosystem?

4.4.1 Summary of activities, outputs and outcomes expected from the ToC

One of the 5GIR programme objectives was to foster the emergent 5G ecosystem. As well as being an objective in its own right, the ToC assumes that fostering a 5G ecosystem will lead to an increased understanding of the value of advanced connectivity networks and services across businesses and organisations in the ecosystem, the development of commercial relationships between members of the ecosystem, and thereby further investment and economic growth.

The ToC shows that for the programme to have fostered a 5G ecosystem a number of activities and outputs/outcomes are required. These include:

- 5GIR areas need to have worked with local partners to identify strategic sectoral projects and use cases, based on specific regional characteristics, local needs and existing strengths, and subsequently engage a range of partners to deliver use cases. Collaboration among these partners in the delivery of the projects is expected to lead to increased awareness among stakeholders involved in use cases of the benefits of 5G/advanced wireless technology adoption, and among network providers of the needs and requirements of those using their networks/technology.
- Delivery of knowledge sharing activities and dissemination of lessons learnt by 5GIR areas, which are expected to support the fostering of the wider 5G ecosystem by: building relationships between partners; increasing learning opportunities between partners; and ultimately increasing capabilities within the ecosystem.

In answering this research question, evidence of the delivery of these outputs and outcomes and the strength of the causal pathways is assessed.

4.4.2 Evidence of the fostering of an emergent 5G ecosystem

4.4.2.1 Involvement and collaboration of partners in the delivery of projects

The applications for funding from 5GIR areas outlined how they would engage with other partners (both network providers and use case stakeholders) to deliver their projects. Evidence from the benefits trackers, interviews and other programme documentation shows that LAs have engaged with a number of other partners through the programme.

Indeed, in interviews, a number of 5GIR project leads felt that their projects had demonstrated effective multi-stakeholder collaboration models involving public sector, private companies, and academic institutions; many project leads stated that their project had helped establish formal and informal networks between technology providers, end users, and LAs. Consistent with this, evidence from the network provider and use case stakeholders survey (see Appendix 2) shows that a majority of respondents agreed or strongly agreed that the 5GIR intervention had created an on-going partnership with other partners that would facilitate future engagement and activities[34]. In addition, a majority agreed or strongly agreed that an ecosystem of advanced connectivity users had been developed in the area as a result of the 5GIR project[35].

Whilst some 5GIR areas did have pre-existing relationships with some of their suppliers/stakeholders, most 5GIR areas needed to establish new relationships as part of their 5GIR projects. Indeed, Section 3.2.2.2, showed that some 5GIR areas struggled to identify and engage with relevant stakeholders at the start of their project. This suggests that much of this collaboration has been brought about between parties that were not known to each other (or did not have an established relationship) before the programme and so were brought together as a direct result of the 5GIR programme. In addition, given that all 5GIR project leads said their project would not have gone ahead in the timescales of the original programme without DSIT funding and that the majority of network providers and use case stakeholders said that they would not have provided the advanced connectivity networks or services without DSIT funding, this suggests that much of this collaboration is attributable to the programme.

DSIT officials reported that many projects involved lots of proactive companies working together to deliver products and services. That said, DSIT officials said they would have liked to have seen more engagement and involvement from the MNOs in the delivery of interventions, but noted that each of the regions did involve a connectivity provider/partner.

4.4.2.2 Knowledge sharing and other engagement activities with stakeholders involved in project delivery

Qualitative information drawn from the benefits trackers provides evidence that a range of forums were used by 5GIR areas to engage, collaborate and share knowledge with stakeholders involved in the delivery of 5GIR projects. Some examples of the forums included: regular meetings (most often meetings with stakeholders on project delivery); various workshops (either organised by the 5GIR area itself or a related body/organisation); networking events (either organised by the 5GIR area itself or a related body/organisation like the local chambers of commerce for example); preview or launch events (for instance to publicise an implemented use

[34] Eight out of the 11 network providers and 82% of use case stakeholders who responded to the surveys said that they tended to agree or strongly agreed that the 5GIR project had created an on-going partnership with other partners.
[35] Seven out of the 11 network providers and two-thirds of use case stakeholders who responded to the surveys said that they tended to agree or strongly agreed that an ecosystem of advanced connectivity users had been developed in the area as a result of the 5GIR intervention

case); and other pre-existing organisations or events which went outside the immediate project/area like Connected Britain or Connected North for example.

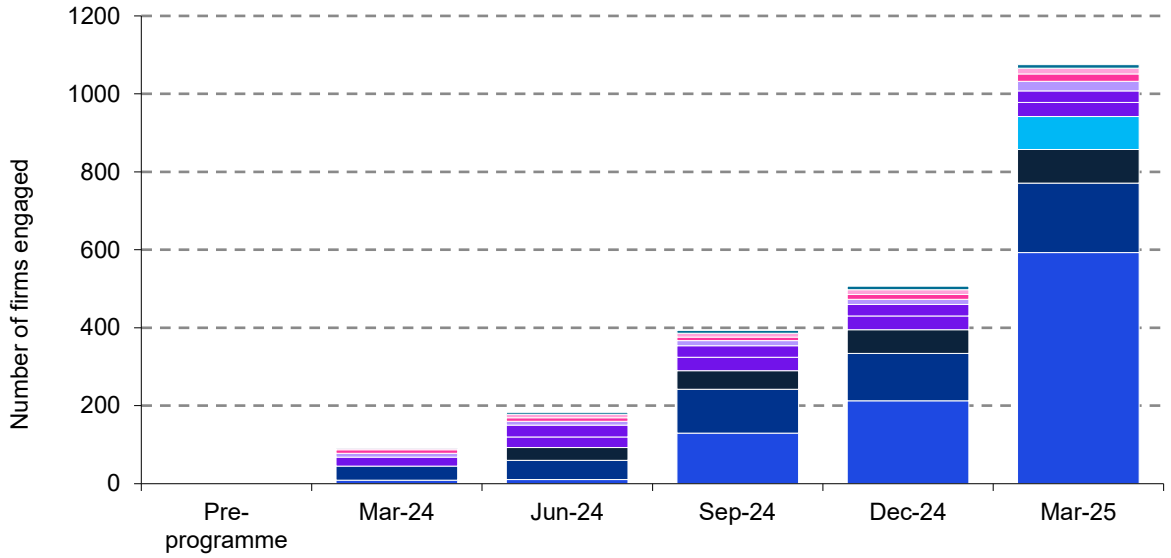
Qualitative information from the lessons learnt from projects showed that many 5GIR areas noted that their engagement with third parties, such as charities and wider stakeholders, had offered opportunities to enhance the reach and impact of their project. These areas reported that collaboration with such groups, along with third-party suppliers, provided valuable resources, expertise, and new advanced connectivity solutions to issues faced by consumers and/or businesses. These 5GIR areas also highlighted that proactive stakeholder identification and providing a forum for different parts of the 5G supply chain to be introduced to one another expanded interest, strengthened support, and fostered new business collaborations.

UKTIN officials noted the structures it has in place that have supported this collaboration. For example, officials stated that membership of its different cluster groups, which were used by UKTIN to share knowledge between different parties, spanned academia, public sector (including LAs) and the private sector. This illustrates that a range of different stakeholders are involved in the existing knowledge sharing forums organised by UKTIN and at which a number of 5GIR areas have presented or been represented.

This knowledge sharing is considered to be largely attributable to the programme given that it would not have occurred had the partnerships as part of the projects not been formed. As set out above, there is evidence that the programme contributed towards the development of these relationships and the subsequent knowledge sharing would not have happened without the programme. This is consistent with a finding from the 5G Testbeds and Trials Interim Evaluation, which identified that especially with private organisations, knowledge sharing is not an aspect that would normally be promoted as part of project delivery.

In terms of the reach of these activities, the benefits trackers provide data on the total number of firms from key sectors in the region who engage with the project. This could include attending workshops or events put on by the project, or via direct consultation. Figure 4.1 below shows that over 1000 firms have been engaged in the programme in the period to March 2025, suggesting a breadth of participation in the programme.

Figure 4.1: Total number of firms engaged in the 5GIR programme over time (split by anonymised 5GIR area with each colour representing a separate area)



Source: KPMG analysis based on 5GIR benefits tracker data

The chart shows that four 5GIR areas accounted for over 85 per cent of all firms engaged. In part, this reflects the nature of interventions – with some 5GIR interventions involving more organisations than others. For instance, some of the interventions focused on a small number of use cases and therefore involved fewer businesses than interventions with a number of different strands to them, with multiple use cases within each strand. Illustrating this, the 5GIR area that reported the highest number of firms engaged was also the area that reported the highest number of implemented use cases by March 2025. The data also reflect the stage of delivery that 5GIR projects were at by March 2025. In general, the areas that had engaged with a high number of firms tended to be further through the delivery of their project, in terms of implementation of use cases and also in terms of running communication or dissemination events relating to their project, than the areas that had engaged with a low number of firms. Nevertheless, all 5GIR areas had engaged with at least 9 firms by the end of March 2025 and there was wide sector representation across the 5GIR programme as a whole.

Most of the forums set up by 5GIR areas highlighted above related directly to the delivery of their 5GIR project. In the absence of the programme, it is not clear what incentive LAs would have to set up such forums, so they are considered to be largely attributable to the programme.

4.4.3 Conclusion on the extent to which a 5G ecosystem has been fostered

Delivery of individual 5GIR projects has involved a large number of delivery partners, and evidence from Section 3.2.2.2 suggests that many of these represented new relationships formed as part of the programme. These partnerships spanned a range of stakeholders, though there are areas where it was identified that collaboration could have been stronger (e.g. with MNOs).

A variety of different forums to support the delivery of projects have been used in the period to March 2025 to share information across different delivery partners and other stakeholders of both the delivery of 5GIR projects and their expected benefits. In addition, data from the benefits trackers shows that through various activities the programme has engaged over 1000 firms.

Demonstrating the value of this activity, 5GIR project leads, network providers and use case stakeholders all commented positively on the relationships developed through the programme and the development of an advanced wireless technology ecosystem.

In terms of attribution, the evidence suggests that much of the collaboration brought about in 5GIR projects, as well as knowledge sharing, was between parties that were not known to each other before the programme and so was a direct result of the 5GIR programme. In addition, given that the majority of stakeholders to 5GIR projects said that their project would not have gone ahead in the timescales of the original programme without DSIT funding, this suggests that much of this collaboration and knowledge sharing is attributable to the programme.

The evidence presented in this section suggests strong progress towards achieving a 5GIR ecosystem across 5GIR projects. In the extension period, further collaboration between organisations and stakeholders is to be expected. In line with the ToC this should lead to the development of lasting commercial relationships, sustaining the ecosystem and supporting longer term investment and innovation.

4.5 Finding: To what extent were the 5GIR interventions sustainable post-Government funding (i.e. networks continued after funding)?

4.5.1 Summary of activities, outputs and outcomes expected from the ToC

The ToC for the 5GIR programme identifies that to deliver the three strategic objectives of the programme, 5GIR interventions need to be financially sustainable after DSIT funding finishes. The ToC assumes that sustained 5GIR interventions will evidence and demonstrate the value and viability of advanced connectivity networks and services to other businesses and organisations and thereby encourage further investment, economic growth as well as supporting the 5G ecosystem.

The ToC shows that for the programme to have provided evidence that 5GIR interventions were sustainable after DSIT funding a number of activities and outputs/outcomes are required. These include:

- 5GIR areas need to implement use cases in their area and deliver use case specific outputs and benefits, which subsequently need to be monitored and documented. It is assumed that this will provide evidence of the benefits of use cases which will help develop stronger business cases for future investment in advanced connectivity networks and/or funding of advanced connectivity services.
- 5GIR areas needed to use business cases to demonstrate the viability of use cases and use this to influence decision makers to secure ongoing investment.

— Benefits of advanced wireless technologies also need to be recognised by wider stakeholders, ideally resulting in commitment from wider stakeholders to invest in/ help fund advanced wireless technology and use cases.

In answering this research question, evidence of the delivery of these outputs and outcomes and the strength of the causal pathways is assessed.

4.5.2 Evidence on the sustainability of 5GIR interventions

4.5.2.1 Evidence of realised benefits from use cases and development of robust business case

Section 4.2 sets out evidence on the extent to which 5GIR areas had realised benefits from their use cases by March 2025, and Section 4.3 sets out evidence on the extent to which such benefits have been documented and disseminated. The evidence shows that whilst 119 use cases had been implemented by March 2025 and there had been some dissemination of lessons learnt within 5GIR areas, few benefits had been realised (and therefore documented) across 5GIR areas.

As identified in Sections 4.2 and 4.3, the lack of evidence of realised benefits from use cases as of March 2025 has limited the extent to which areas have been able to develop robust business cases for ongoing investment, and therefore secured ongoing funding for business cases so far. Indeed, most 5GIR project leads said it was too early to determine or document, conclusively, the long-term viability for many of their use cases/projects. Viability could be commercial viability or viability in terms of delivering other non-commercial benefits which render the connectivity networks/services worth continuing, for example by delivering public sector benefits in a cost-effective manner.

In line with this, DSIT officials noted that, for projects to be effective in the context of the wider programme, they needed to illustrate effectively the value of connectivity services and associated use cases. DSIT officials felt that this should be a focus area among projects during the extension period: evidencing the business case for investment from the project to make it compelling for senior decision-makers (in both the public and private sectors).

4.5.2.2 Influencing of decision makers to secure investment

Given the lack of evidence of use case benefits or development of business cases as of March 2025, 5GIR areas had not progressed to securing investment in their projects. Therefore, as at the end of March 2025, 5GIR project leads said that the sustainability of projects beyond the end of existing contracts could not yet be guaranteed. Nonetheless, in interviews, many 5GIR project leads stated that their projects had been designed with some level of sustainability in mind from the outset. They highlighted that some of the contracts they had negotiated would last for longer than the period of the programme to allow for a longer period for benefits to be derived.

In the interviews, some 5GIR project leads said that a significant factor influencing the sustainability of advanced wireless technology initiatives concerned the need to

be able to convince other parts of organisations/partners of the benefit of such technology. They said that only by persuading other parts of organisations/partners of the value of their advanced connectivity interventions would the technology be incorporated into 'business-as-usual'.

A number of project leads highlighted that, whilst they were currently delivering the advanced wireless technology project, it would be another part of the organisation (or a different organisation altogether) that would need to adopt the technology in the longer term. As such, project leads felt there would need to be a 'change management' aspect to the projects to convince this different part of the organisation of the value and benefit of the advanced wireless technology and, in effect, to ensure the use of the advanced wireless technology continued into the future. Examples of this issue included the social care and/or social housing projects. Responsibility for contracts on social care and social housing sit with different parts of the LA and so robust, compelling business cases will need to be presented to these decision makers to help them adopt the technology. However, project leads noted that whilst robust business cases are a necessary condition for other business areas to adopt the use cases and associated technology it is not as simple as just providing a robust business case. This is because of factors like existing multi-year contract cycles and the need to potentially influence other decision makers (like finance and corporate officials) for example.

Recognising this as a challenge, UKTIN officials noted that their focus had moved over time to actively encouraging adoption of advanced wireless technologies by private or public sector bodies. UKTIN officials said that such activity involved engaging with different parts of organisations, which had not necessarily been part of the programme, and making them aware of the value of advanced connectivity services and working with them to understand how the technology can fit with their contractual situation and business as usual work.

For projects to be sustainable, LAs will need to work through these challenges during the contract extension period, leveraging the support of UKTIN where possible, in order to secure the sustainability of projects.

4.5.2.3 Investment by other stakeholders

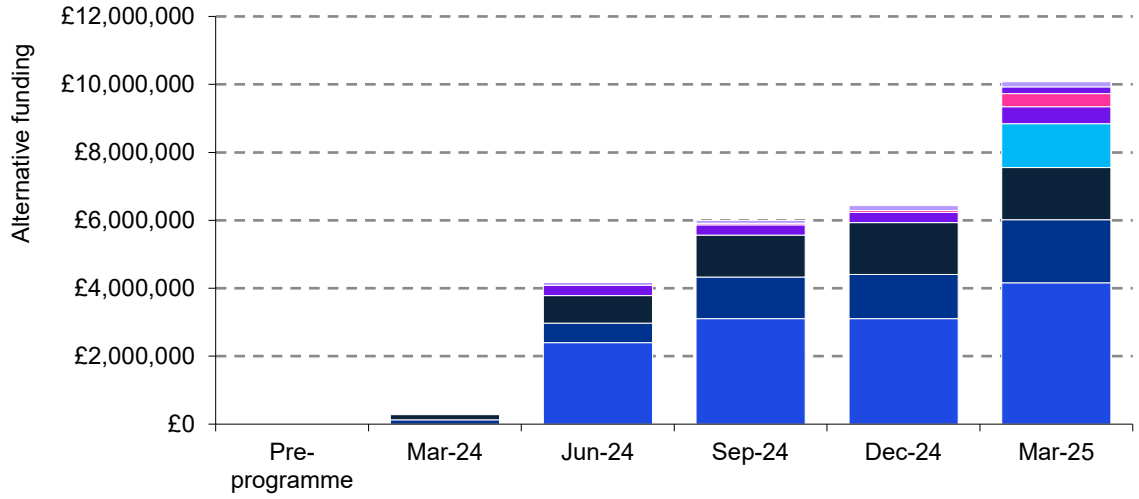
As identified in the ToC, continuation of projects post funding is likely to rely on wider funding, including private sector investment in the projects.

Evidence from project delivery to date suggests that despite a lack of concrete evidence of use case benefits, there is evidence that for some 5GIR areas, in line with the ToC, the existence of the 5GIR project within an area has increased confidence among stakeholders around the 5GIR areas' commitment to advanced wireless technology and, as a result, leveraged additional investment in the projects.

Data from the benefits trackers on alternative funding generated by the 5GIR area (which could include private or LA funding etc.) can be used as evidence of the extent to which there is confidence among stakeholders around the 5GIR areas' commitment to advanced wireless technology and, as a result, support for ongoing

investment in the project. Figure 4.2 below uses data taken from the benefits tracker to show that just over £10 million of alternative funding was claimed to have been generated by eight out of 10 5GIR areas in the period to March 2025.

Figure 4.2: Total amount of alternative funding generated by the 5GIR programme over time (split by anonymised 5GIR area with each colour representing a separate area)



Source: KPMG analysis based on 5GIR benefits tracker data (where alternative funding is reported by 5GIR areas)

The chart shows that the generation of alternative funding has been relatively concentrated, with one 5GIR area accounting for over two-fifths of all alternative funding generated. A further three 5GIR areas account for the vast majority (almost 80 per cent) of the rest of the alternative funding generated. By March 2025, two 5GIR areas had registered no alternative funding. The alternative funding was a mix of public and private investment across a range of sectors (including social care; social housing; manufacturing; ports; and creative industries among other sectors). There was no discernible trend or pattern to the alternative funding across the 5GIR programme in terms of sectors covered or timing of use case implementation.

Whilst it is not possible to categorically attribute this additional funding to the 5GIR programme without further investigating each individual contribution, evidence from the benefits trackers suggests close alignment of this funding with the projects themselves suggesting it wouldn't have been forthcoming without the project being delivered, and can therefore be attributed to the programme.

This additional funding provides evidence of confidence among local stakeholders in the value of the projects and a potential source of future funding to sustain the interventions post DSIT funding. Indeed, evidence from the network provider and use case stakeholder surveys (see Appendix 2) shows that a large majority of stakeholders tended to agree or strongly agreed that advanced connectivity

networks and/or services will continue to be provided in the 5GIR areas beyond the end of the project[36].

4.5.3 Conclusion on the extent to which 5GIR interventions are likely to be sustainable post-Government funding?

Given this is an interim evaluation it is too early to conclude on the sustainability of projects post-DSIT funding. That said, most 5GIR interventions were designed with some level of sustainability in mind.

However, the longer-term sustainability of 5GIR projects is dependent on three main factors. First, the 5GIR projects need to document and evidence their viability either in commercial terms or in terms of delivering other non-commercial benefits which render the connectivity networks/services worth continuing (e.g. by delivering public sector benefits in a cost-effective manner). Second, the organisation or department with long-term responsibility for the advanced connectivity networks and/or services implemented through the 5GIR intervention need to be convinced of its viability, and specific challenges associated with this overcome. Finally, linked to the second factor, commitments among wider stakeholders need to be secured to support ongoing delivery.

Strong documented evidence of commercial viability (or viability more broadly) did not exist at the end of March 2025 for most 5GIR projects. Nevertheless, many use cases are now implemented – allowing for the realising and documenting of benefits in time which should help illustrate the viability, or otherwise, of 5GIR interventions. Indeed, despite the lack of documented evidence of the viability of projects, network provider and use case stakeholders said they expected the advanced connectivity networks and services provided in 5GIR areas to continue into the future.

In addition, the levels of additional funding from wider stakeholders generated by the projects, at just over £10 million, provides some confidence that ongoing private or public investment may be secured. Whilst it is not possible to categorically attribute this additional funding to the 5GIR programme without further investigating each individual contribution, evidence from the benefits trackers regarding the nature of the additional funding suggests close alignment of the funding with the projects themselves. This implies that the funding may not have been forthcoming without the project being delivered, and provides some evidence to support the casual link between the projects and additional investment.

Nonetheless, given the dependencies noted above, there still remains uncertainty as to the extent to which interventions will be sustainable post funding.

[36] Nine out of the 11 network providers that responded to this question in the survey tended to agree or strongly agreed that they will continue to provide their advanced connectivity networks and services in the 5GIR area beyond the end of the project and 90% use case stakeholders that responded to the survey think it somewhat or very likely that they will continue to provide their use case in the 5GIR area beyond the end of the project (i.e. March 2026).

4.6 Finding: To what extent is there evidence of the 5GIR programme encouraging and/or increasing long-term adoption of advanced wireless technology?

4.6.1 Summary of activities, outputs and outcomes expected from the ToC

The ToC for the 5GIR programme identifies that to deliver the end impacts of the programme, it needs to have encouraged and/or increased the long-term adoption of advanced wireless technology. The ToC assumes that long-term adoption of advanced wireless technology will demonstrate the value of advanced connectivity networks and services to other businesses and organisations and thereby encourage further investment, economic growth as well as supporting the 5G ecosystem.

The ToC shows that for the programme to have increased long-term adoption a number of activities and outputs/outcomes are required. These include:

- Through the implementation of use cases; the delivery of realised benefits from the use cases; and the dissemination of this information outside the 5GIR area, organisations need to have obtained an increased awareness of the advantages of adopting advanced wireless technology. This increased awareness is assumed to lead to increased demand for the adoption of advanced wireless technology and, consequently, increased investment in advanced connectivity networks and services.
- The 5G ecosystems need to take forward future opportunities for advanced wireless technology, supporting its future adoption. This is expected to lead to further collaboration between organisation and stakeholders that were brought together through the use cases, developing lasting commercial relationships, further fostering the 5G ecosystem and leading to increased commercial investment.
- Similarly, 5G ecosystems need to promote the generation of privately funded projects through bringing those likely to demand advanced connectivity services together with those who can supply such networks and services. This is expected to lead to a pipeline for future investment with more commercial investment in advanced wireless technology taking place as a result.

In answering this question evidence that such activities and outputs have occurred and the extent to which they've been successful in encouraging or increasing the long-term adoption of advanced wireless technology is considered.

4.6.2 Evidence on the programme encouraging and/or increasing long-term adoption of advanced wireless technology

4.6.2.1 Delivery of realised benefits from use cases and wider dissemination

Section 4.2 sets out evidence on the extent to which 5GIR areas had realised benefits from their use cases by March 2025. Section 4.3 sets out evidence on the extent to which such benefits have been documented and disseminated. This evidence showed that few use cases had realised benefits by March 2025 and most dissemination events had been focused on individual 5GIR areas, rather than wider dissemination outside 5GIR areas.

This is expected to have limited progress towards encouraging and/or increasing long term adoption. However, planned activity over the remainder of the programme in relation to evidencing and disseminating benefits should further support this outcome.

4.6.2.2 5G ecosystems support long-term adoption of advanced wireless technology

Section 4.5 sets out the progress made in the period to March 2025 on the development of 5G ecosystems within 5GIR areas. It found that a majority of stakeholders tended to agree or strongly agreed that on-going relationships had been developed through the programme that would facilitate future engagement and activities. A majority of stakeholders also agreed that an ecosystem of advanced connectivity users had been developed as a result of individual projects.

These ecosystem activities and outputs are consistent with the chains of causality in the ToC which are ultimately expected to lead to wider adoption of 5G and advanced connectivity networks and services.

4.6.2.3 Generation of privately funded projects and pipeline for future investment

As of March 2025, there was no evidence from projects or project stakeholders of a confirmed pipeline for future investment. However, there is evidence to indicate an increased appetite for investment in advanced wireless technologies.

Section 4.5.2 evidenced the alternative funding that 5GIR areas registered, through the benefits trackers, as being associated with their projects, with a total of £10 million of alternative funding having been generated in the period to March 2025. In addition to this, a few 5GIR project leads noted that the existence of the 5GIR project had made the region more attractive to organisations interested in advanced wireless technologies. One project lead highlighted inward investment into the area and into the sector in which the 5GIR intervention was involved. Whilst the project lead did not attribute the inward investment to the 5GIR project itself, they felt the existence of the 5GIR intervention helped create an environment in which such investment was more likely to occur (for instance creating a virtuous circle of activity, demand and further investment). Another project lead highlighted how the 5GIR projects had enabled it to position the region as a “real centre of excellence” and, as a result, had brought about a “significant strategic partnership” with a large private sector organisation focused on trialling advanced connectivity service solutions to various public and private sector problems.

In the interviews, a few 5GIR project leads said that this additional private and public sector investment, in their view, showed confidence in advanced wireless technologies.

Indeed, evidence from the network provider and use case stakeholder survey shows that a majority of respondents tended to agree or strongly agreed that they would increase their investment in existing connectivity networks and services in the 5GIR

areas beyond the end of the project[37]. Similarly, a majority said they would invest or increase investment in similar networks and/or use cases in other LAs as a result of the project[38].

To assess the extent to which the stated investment intentions of 5GIR stakeholders are likely to be attributable to the 5GIR programme or not, evidence from wider research is used. The positive sentiment towards investment in advanced connectivity networks and services highlighted in the network provider and use case stakeholder surveys is supported by a recent report by Ericsson. However, that report also notes that there are barriers to businesses investing in advanced connectivity networks and services[39].

Consistent with the existence of such barriers to investment, data shows that the UK would appear to be lagging many other countries in 5G investment. Indeed, gross fixed capital formation investment on telecommunication equipment by the ICT sector between 2014 and 2020 as a share of GDP was lower in the UK when compared to the EU and the US.[40]

Considering the information set out above, whilst UK businesses report the value of 5G and advanced connectivity services in the Ericsson survey, it would seem that investment levels in 5G and advanced connectivity the UK in the past few years have been generally lower than in the EU and US. This is consistent with UK businesses experiencing barriers to investing in advanced connectivity networks and services. It also suggests that if the investment intentions of stakeholders in the 5GIR programme are realised, there is a strong likelihood that the 5GIR programme will have encouraged such investment.

4.6.3 Conclusion on the programme encouraging and/or increasing long-term adoption of advanced wireless technology

Direct evidence on the adoption of advanced wireless technology is difficult to gather, and at this early stage in the programme, impacts on long term adoption would not be expected to be seen.

Stakeholders stated that a 5G ecosystem has been developed in 5GIR areas. With the extension to the programme, further evidence of the benefits of adoption and subsequent dissemination of this outside 5GIR intervention areas should be

[37] Seven out of the 11 network providers who responded to the survey said that they tended to agree or strongly agreed that they would increase investment in the network or similar networks in the 5GIR area and 80% of use case stakeholders who responded to the survey said that they were somewhat or very likely to increase investment in use cases in the 5GIR area beyond the end of the project.
[38] Seven out of the 11 network providers who responded to the survey said they tended to agree or strongly agreed that they would increase investment in similar networks in other areas and 55% of use case stakeholders who responded to the survey said that they were somewhat or very likely to increase investment in similar use cases in other LAs as a result of the project.
[39] The report shows that 38 per cent of enterprises stated the complexity of upgrading is preventing them from adopting 5G solutions, and 36 per cent lacked the skills required to manage the network infrastructure.
[40] Other sources of information which suggest a lower level of investment in advanced connectivity in the UK as compared to other countries includes data from OpenSignal (from 2024 – see: Network-failure-Dec-2024.pdf) reported by the Social Market Foundation which shows that, in terms of mobile 5G coverage, the UK ranks 30th out of 39 countries for 5G availability as well as data from the European 5G Observatory (see: European 5G Observatory | Shaping Europe's digital future) which shows that the number of operating 5G base stations per 100,000 inhabitants in the UK as at December 2024 lagged the US, EU, China, Japan and South Korea among others.

possible. Such activity and outputs would be consistent with the longer term adoption of advanced wireless connectivity as set out in the ToC.

Additional funding leveraged into 5GIR projects as of March 2025 provides evidence of the appetite within the private and public sectors to invest in advanced wireless technologies. Whilst it does not represent adoption per se, investment intentions by stakeholders in 5GIR projects suggest an increased inclination to invest in advanced connectivity networks and services outside 5GIR areas as a result of the project. Given the evidence on recent investment in 5G in the UK, when compared to other international countries, this would suggest that if such investment intentions are realised by stakeholders in the 5GIR programme, then the 5GIR programme might have had a positive impact on organisations' investment intentions.

4.7 Conclusion on the interim impact evaluation research question

The overarching research question for the interim impact evaluation is: to what extent did the 5GIR programme achieve the outcomes it set out to achieve within the timescale of the evaluation and to what extent can these outcomes be attributed to the programme? This conclusion considers the findings from the analysis of the supplementary evaluation research questions to answer the overarching evaluation research question.

4.7.1 Delivery of realised benefits

By the end of March 2025, eight of the 10 5GIR areas had brought together a range of stakeholders to implement a total of 119 use cases, spanning a range of sectors.

However, whilst use cases had been implemented in all but two 5GIR areas by March 2025, in most cases implementation had been delayed and so projects had limited time to realise benefits from their projects. As a result, by the end of March 2025, few 5GIR areas had been able to evidence the benefits from their interventions.

Whilst attributing activity and outcomes to the 5GIR programme is challenging without a robust comparison group, in the interviews, all 5GIR project leads reported that their project would not have taken place in the timescales of the original programme without DSIT funding. Similarly, the majority of respondents to the network provider and use case stakeholder surveys (see Appendix 2 for more details) said that without DSIT funding they would not have provided the advanced connectivity network and/or services in the 5GIR area[41]. This suggests the delivery of these use cases was largely attributable to the programme. However, it is noted that some of the recipients of 5GIR funding were active in developing 5G use cases prior to funding (having been recipients of previous Government programmes such as 5G Testbeds and Trials) and, equally, there are non-5GIR areas with a similar background that have progressed 5G use cases in the absence of funding such as

[41] Three of the four network providers and 63% of the use case stakeholders who responded to the survey said it was somewhat or very unlikely that they would have invested in advanced connectivity networks and services/ in the use cases in the 5GIR area.

Liverpool 5G. This suggests the issue of attribution may not be clear cut, and should be explored further as part of the final evaluation.

Looking forward, by the end of March 2025, many of the factors required to realise benefits from projects were in place. For example, use cases had been (or were about to be) implemented and outputs and outcomes from use cases were being actively monitored. In addition, by March 2025, a few 5GIR areas were able to provide a clear rationale for how benefits will be realised from their projects. With the extension period, 5GIR project leads expect to realise benefits from use cases already implemented and to also implement more use cases. This provides confidence that evidence of benefits from at least some of the 5GIR projects will be realised in time.

4.7.2 Documentation and dissemination of the benefits of advanced wireless technology adoption

In the period to March 2025, all 5GIR areas had been monitoring their projects through the benefits tracker. However, the documentation of benefits realised from use cases had been limited, given most areas had only just implemented use cases by March 2025.

The evidence shows that a large number of dissemination events had been delivered as part of the 5GIR programme. However, most of these events have been focused on the individual 5GIR area itself, rather than wider dissemination outside the intervention area. Given the direct link to the programme learnings, and limited incentives to conduct dissemination activities without it being a requirement of the programme, the documentation and dissemination activity that has occurred is considered to be largely attributed to the programme.

Over the final year of the programme, in order for the end impacts of more commercial investment and increased economic growth to be achieved, the ToC requires realised benefits to be delivered from use cases and for 5GIR areas to disseminate the findings more widely (particularly outside their area). Moreover, based on the evaluation evidence, a key focus of this activity should be on identifying and reaching those that are not aware or less interested in advanced wireless technologies. This should help increase the understanding among other organisations in the area and outside as well as the wider sector of the benefits of 5G and associated connectivity services.

4.7.3 Fostering a 5G ecosystem

Delivery of individual 5GIR projects has involved a large number of delivery partner and evidence from Section 3.2.2.2 suggests that many of these represented new relationships formed as part of the programme.

In addition, a variety of different forums to support the delivery of projects have been used in the period to March 2025 to share information across different delivery partners and other stakeholders around the delivery of the 5GIR project. Data from the benefits trackers shows that through various activities the 5GIR programme has engaged over 1000 firms.

Demonstrating the value of this activity, 5GIR project leads, network providers and use case stakeholders all commented positively on the relationships developed through the programme and the development of an advanced wireless technology ecosystem.

This suggests strong progress towards fostering a 5G ecosystem. In the extension period, further collaboration between organisations and stakeholders is to be expected. In line with the ToC, this should lead to the development of lasting commercial relationships, sustaining the ecosystem and supporting longer term investment and innovation.

4.7.4 Sustainability of interventions post funding

Given this is an interim evaluation it is too early to conclude on the sustainability of projects post-DSIT funding. That said, most 5GIR interventions were designed with some level of sustainability in mind.

However, the longer-term sustainability of 5GIR projects is dependent on three main factors. First, the 5GIR projects need to document and evidence their viability either in commercial terms or in terms of delivering other non-commercial benefits which render the connectivity networks/services worth continuing (e.g. by delivering public sector benefits in a cost-effective manner). Second, the organisation or department with long-term responsibility for the advanced connectivity networks and/or services implemented through the 5GIR intervention need to be convinced of its viability, and specific challenges associated with this overcome. Finally, linked to the second factor, commitments among wider stakeholders need to be secured to support ongoing delivery.

Strong documented evidence of commercial viability (or viability more broadly) did not exist at the end of March 2025 for most 5GIR projects. Nevertheless, many use cases are now implemented – allowing for the realising and documenting of benefits in time which should help illustrate the viability, or otherwise, of 5GIR interventions. Furthermore, the levels of additional funding generated by the projects among wider stakeholders provides some confidence that ongoing private or public investment may be secured. Indeed, despite the lack of documented evidence of the viability of projects, network provider and use case stakeholders said they expected the advanced connectivity networks and services provided in 5GIR areas to continue into the future.

Nonetheless, given the dependencies noted above, there still remains uncertainty as to the extent to which interventions will be sustainable post funding.

4.7.5 Long term adoption of advanced wireless technology

Direct evidence on the adoption of advanced wireless technology is difficult to gather, and at this early stage in the programme, impacts on long term adoption would not be expected to be seen.

Nonetheless, based on the ToC, there is evidence that some of the conditions for long term adoption are developing. Stakeholders stated that a 5G ecosystem had

been developed in 5GIR areas and, with the extension to the programme, further evidence of the benefits of adoption and subsequent dissemination of this outside 5GIR intervention areas should be possible. Such activity and outputs would be consistent with the longer term adoption of advanced wireless connectivity as set out in the ToC.

Leveraged investment as of March 2025 provides evidence of the appetite to invest in advanced wireless technologies. Whilst it does not represent adoption per se, investment intentions by stakeholders in 5GIR projects suggest an increased inclination to invest in advanced connectivity networks and services outside 5GIR areas as a result of the project. Given the evidence on recent investment in 5G in the UK, when compared to other international countries, this would suggest that if such investment intentions are realised by stakeholders in the 5GIR programme, then the 5GIR programme might have had a positive impact on organisations' investment intentions.

4.7.6 Overarching conclusion

Taking all the evidence together, by March 2025, the 5GIR programme had achieved a lot of the outputs and some of the outcomes it had originally set out to achieve – although not all. The main areas where delivery fell below original expectations included the fact that most 5GIR projects had not been able to evidence realised benefits and/or disseminate their learning beyond their immediate area within the original timeframes for the programme.

With the extension to the programme, 5GIR areas are in a good position to evidence realised benefits given that most have implemented use cases so that benefits can start to be realised from them. This should enable the documentation and dissemination of benefits derived from the use cases. The dissemination of the findings on benefits should help improve the understanding of organisations around the benefits of advanced wireless technology adoption and so increase economic activity and investment. These are all aspects for 5GIR areas to focus on in the extension period. In addition, the final evaluation due to be conducted next year will need to consider the extent to which these activities, outputs and outcomes have been achieved and, as a result, the extent to which the 5GIR programme can be expected to drive economic growth and accelerate commercial investment in advanced connectivity services in the next few years.

5 Implications for future delivery

5.1 Introduction

This section sets out the main findings and implications drawn from the interim evaluation for two distinct purposes:

- Future programme delivery
- The last 6 months of 5GIR delivery and the final evaluation

5.2 Future programme delivery

Set out below are a series of findings aimed at supporting the effective delivery of future DSIT programmes.

5.2.1 Up-front funding for programmes managed by LAs

The funding mechanism used for 5GIR was considered by programme stakeholders to have had a positive influence on the delivery and effectiveness of 5GIR projects over and above what would have happened with a more traditional funding model. The provision of up-front funding was found to have made decision making within LAs faster and more straight-forward than would have been the case with a more traditional funding method.

Whilst the funding method provides fewer levers for DSIT to steer or influence projects during delivery, at least three factors reduce the risks around this issue. First, LAs are public bodies so can be held to account for the delivery of plans which have been published; this should provide a strong incentive for LAs to deliver what they said they would in their original application/plans. Second, as public bodies, LAs finances will be scrutinised in a similar way to central government departments; this should provide confidence to DSIT around the effective use of public funds. Third, the technical support provided by DSIT officials to projects means that throughout an individual projects' delivery DSIT, through the technical advisers, would be able to influence projects and support their effective delivery.

As a result, the benefits of the funding mechanism were universally considered to outweigh any risks suggesting the model could be beneficial in future programmes where DSIT (or other Government departments) contract through LAs. However, it should be noted that this point relates to programmes contracted through LAs; such findings might not hold for programmes contracted through other lead partners, like industry for example.

5.2.2 Changes to the initial application guidance

Findings from the process evaluation identified two aspects of the application guidance where improvements could have been made, which should be considered in relation to future programmes. These concern:

- Nature of funding: guidance could be made clearer on how capital R&D funding like that used in the 5GIR programme could be used for revenue purposes – particularly in relation to funding project management resource. This might encourage: i) more applications (e.g. from organisations that assume such capital funding cannot be used for PMO costs); and, ii) more effective set up and subsequent delivery by successful applicants.
- Procurement: guidance could be made clearer around how successful applicants might best procure their advanced wireless technology projects (or similar). Specifically, in this instance, focussing on the service required rather than getting into the technical detail of how that service was to be provided. Supplying guidance on this might limit the use of technical consultants (or similar) in future applications and projects and focus more resource on the delivery of the overall objectives of the programme.

5.2.3 Programme timescales

Given the innovative and technical nature of programmes like 5GIR, there is a need to provide sufficient time for projects to effectively set-up, procure, deliver and then measure and document impact. This is particularly the case with programmes focused on complex delivery (such as advanced connectivity networks and services) because these types of programmes might be more likely to encounter unforeseen challenges which can impact on delivery timeframes. However, this need for a relatively long delivery timeframe often conflicts with public sector spending cycles as well as the incentive for applicants to over promise on delivery in the hope of submitting a successful application for funding.

5GIR areas identified that one solution to this would be splitting the programme into two distinct aspects: i) the delivery of infrastructure; and ii) the realisation and documentation of benefits. This would involve the majority of funding being spent in the initial infrastructure delivery phase but with a much smaller funding provision, primarily to cover project management costs, made for later years to allow for projects to continue to run and for benefits to be realised and documented. Whilst this would involve the commitment of resources outside spending review cycles, the amount could be relatively small and it might provide for a more robust assessment of a programme's impact in the longer term.

5.2.4 DSIT technical support to programmes

A consistent, positive, theme from the 5GIR interim evaluation was the strong technical support provided by DSIT. This support was found to have supported the effective delivery of projects from a technical perspective, but was also found to have provided a mechanism through which DSIT was able to stay closely engaged with and influence projects to maintain and encourage alignment with programme objectives. This may be considered particularly useful in cases where upfront grant funding is provided and therefore there are fewer formal checks on project activities and spend.

5.2.5 Project management capability/capacity

Many of the factors cited by 5GIR areas for the delayed delivery of their projects derive from an underestimation of project management capacity/capability. Whilst the original 5GIR application did have questions that asked specifically about applicants' project management capabilities and capacity, a greater weight could be put on these answers to avoid subsequent issues with delivery.

In addition, given a number of 5GIR areas explicitly cited the lack of forward planning as an issue for their projects, a challenge session at the very start of projects may be beneficial, where the applicants' plans for the delivery of the project are scrutinised and tested in some detail in order to identify and help plan for any issues.

5.2.6 Sharing of information across projects

A number of 5GIR areas said that there could have been more sharing of knowledge gained through the programme across 5GIR areas. Accepting that there may be issues around confidentiality with some information, it may be that for future programmes – as well as possibly for the final stage of delivery of the 5GIR programme - a common platform for sharing information could be established. Moreover, whilst all areas had quarterly progress meetings, it may be that a periodic meeting of all areas/projects might be valuable to share the main points coming out of the programme at that point in time. Such sharing of knowledge might support the effective delivery of projects by sharing best practice and overcoming common problems for example.

5.3 The last 6 months of 5GIR delivery and the final evaluation

Set out below are a number of findings aimed at supporting the effective delivery of the 5GIR programme during the extension period as well as the final evaluation.

5.3.1 Effective documentation of the benefits from use cases

The ToC for the 5GIR programme shows that the delivery of realised benefits from use cases is fundamental to the delivery of the end impacts of the programme. At the interim evaluation stage, little evidence of the benefits from use cases had been documented. However, it is not clear at this stage how the benefits from use cases are to be effectively documented going forward. 5GIR areas have been encouraged to focus on developing business cases for their projects but the data and information required to produce a comprehensive and compelling business case has not been produced to date.

In the final year of the programme, it will be important that 5GIR areas continue to complete the benefits trackers and report this regularly to DSIT, and in addition to this, that areas document data and information on benefits and costs from their individual use cases. That is, the documentation will need to provide detailed information from which both potential adopters of advanced connectivity services and network providers can assess the value of advanced connectivity services. For potential adopters this will mean detailed information on the benefits realised from the individual use cases deployed – ideally both monetary benefits as well as non-monetary benefits (e.g. wider public benefits that might derive from the use cases

like improved environmental outcomes for instance). All non-monetary benefits will need to be valued in line with Green Book guidance to allow for a full understanding of the benefits derived from individual use cases. For network providers this will mean detailed information on the potential aggregation of benefits from a range of use cases deployed on a single connectivity solution to provide an understanding of the total benefits that are achievable from an individual connectivity solution. In addition, for both potential adopters and network providers, detailed information on the costs of the advanced connectivity solutions used (both in terms of capital costs and on-going revenue costs) and apportioned to individual use cases will also be required in order to fully evaluate the benefits of use cases as compared to their costs.

Consistent and sufficiently detailed recording of outputs, benefits and costs – as outlined above - will be important for dissemination of findings, the development of future business cases, as well as informing analysis as part of the final evaluation of the programme. The benefits tracker is unlikely to be able to collect this information, at least in its current format, so sector deployment reports are likely to need to be provided before the end of the programme to ensure such detailed information is collected for future dissemination. This may require additional guidance and oversight from DSIT to ensure the quality of reporting.

5.3.2 Dissemination of findings

The ToC sets out that dissemination of findings from the 5GIR programme outside 5GIR intervention areas is important to increase the understanding of organisations outside 5GIR areas of the value that can be derived from advanced connectivity networks and services.

Whilst a requirement of the programme was that individual 5GIR areas would disseminate findings outside their area, the fact that the programme ends in March 2026 means that 5GIR projects will not be contracted to deliver such activity beyond that point. Moreover, given the experience of limited dissemination in the period to March 2025, it may be that an insufficient level of dissemination will have been carried out by March 2026 – particularly to encourage organisations in other areas to adopt advanced connectivity technology. As a result, more central coordination of dissemination activity might be required to ensure that all non-5GIR areas are made aware of all the benefits achieved through the 5GIR programme and understand how they might take advantage of advanced connectivity networks and services. Indeed, whilst UKTIN are performing this coordinating role through to March 2026, at the time of the interim evaluation, it is not clear whether or how such centrally coordinated dissemination will take place beyond March 2026. There may therefore be a role for DSIT to coordinate dissemination activity post-March 2026.

5.3.3 Influencing decision-makers

The interim evaluation shows that in order for many 5GIR projects to become sustainable and/or for other organisations to adopt advanced connectivity services, decision makers need to be convinced of the advantages of adopting such technology. As noted earlier, this is likely to require the persuading of other parts of organisations/partners of the value of advanced connectivity services. That is, whilst

those delivering the interventions may be convinced of the value of advanced connectivity services, it is likely to be another part of the organisation (or a different organisation altogether) that needs to adopt the technology in the longer term. Whilst some of these decision makers might be engaged in 5GIR projects and/or convinced by the dissemination activity outlined in the previous section, some may not. As a result, activity akin to a 'change management' programme may be needed to convince a different part of the organisation, and/or those not engaged with advanced connectivity, of the value and benefit of the advanced wireless technology to ensure the advanced wireless technology continues to be used (or is adopted) in the future.

To achieve sustainability for their interventions, 5GIR areas are likely to need to have well defined plans to influence decision makers in place, and may benefit from leveraging support highlighted by UKTIN in influencing stakeholders to encourage adoption. Whilst 5GIR areas are likely to undertake this activity for their own interventions, it is unlikely that they will have the time or resources to undertake similar 'change management' activity with other organisations either within their region or outside. Whilst UKTIN can deliver such activity in the period to March 2026, at the time of the interim evaluation it is not clear to what extent this activity will continue after March 2026. Therefore DSIT may want to consider how it might facilitate more targeted engagement, using the learnings from UKTIN and 5GIR areas, to effectively influence decision-makers post-March 2026.

Appendix 1: Indicators

This appendix sets out potential indicators for various outputs and outcomes related to the 5GIR programme and is taken from the scoping and baseline report[42].

Table A1.1: Output indicators – 5GIR

Activities		Outputs	Output metrics	Source	Expected timing of data collection and realisation of the outputs
Type	Description				
Development and implementation of a strategy/plan to deliver 'stackable use cases' in intervention area	- Intervention areas work with partners to put in place strategies, structures and arrangements to support collaboration and to drive adoption of advanced wireless technologies	- Advanced wireless technology strategy for region	- Publication of advance wireless technology strategy for the region	- Focus groups with 5GIR areas	- Information collected towards the end of the programme (~ April/May 2025) - Output to be realised during the life of programme
	- Intervention LAs provide a focal point of contact for local stakeholders wanting to understand the opportunities and benefits of 5G adoption	- Established point of contact for local stakeholders wanting to understand the opportunities and benefits of adv wireless tech adoption	- Number of firms from key sectors in the region which engage in with the project. - Number of collaboration events attended - Established point of contact	-Benefit Template: Benefit Tracker section - Benefit Template: Knowledge Dissemination section - Focus groups/interviews with use cases providers and DSIT officials	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025)

[42] KPMG, 5G Innovation Regions and Smart Infrastructure Pilots Programme Evaluation: Scoping and baseline report, May 2024

					- Output to be realised during the life of programme
	- Intervention LAs work with local partners to identify strategic sectoral projects and use cases, based on specific regional characteristics, local needs and existing strengths	- List of potential use cases to deliver	- Total use cases deployed per region	- Benefit Template: Benefits Tracker section	- Information collected each quarter through Benefit Template - Output to be realised during the life of programme
	- In some cases, intervention LAs will provide educational and upskilling opportunities for local businesses - e.g. staff will be trained to operate the use case equipment technology	- Staff trained	- Number of staff trained/training spend - Number of new Master/PHD graduates in the specialised fields	- Benefit Template: Knowledge Dissemination section - Benefit Template: Knowledge Dissemination section	- Information collected each quarter through Benefit Template - Output to be realised during the life of programme
	- Intervention LAs facilitate procurement of suppliers to deliver selected use cases	- Procurement process for establishing use cases	- Established procurement process	- Focus groups/interviews with 5GIR areas and DISIT officials	- Information collected towards the end of the programme (~ April/May 2025) - Output to be realised during the life of programme

Delivery of use cases across a range of different sectors	Delivery of a number of use cases in the following sectors: - Creative Industries - Transport & Logistics - Advanced Manufacturing - Rural enterprise and tourism - Social Housing - Health and Social Care - Energy - Aerospace and Space - Life Sciences - Food & Drink - Engineering - Public Sector - Rural Industries (Agri Tech + Food Manufacturing) - Water	- Use cases are delivered - Use cases specific outputs (e.g. cell networks; advanced wireless enabled buoys; 5G enabled heat pumps; sensors in ports; CCTVs etc.) - Replicable use cases/ services/ technology - Private network deployments (in some instances)	- Total use cases deployed per region - Private network deployments	- Benefit Template: Benefits Tracker section - Survey of MNOs and network providers (questions possibly incorporated into Benefits Tracker)	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025) - Output to be realised during the life of programme
Monitoring and evaluation of use cases	- Detailed monitoring of data/results from the delivery of use cases	- Information on the deployment of 5G/advanced wireless technology use cases - Evidence of impact of use cases documented for future use	- Number of individual use cases information - Data collection process	- Benefit Template: Benefit Tracker section - Focus groups with 5GIR areas	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025) -Output to be realised during the life of programme

Knowledge sharing / lessons learned for organisations within intervention area	- Delivery of workshops, publication of documents etc. by the intervention LAs detailing key lessons learned from the delivery of use cases.	-Workshops/ Communication campaigns/Dissemination events etc. - Public documents detailing benefits of use cases- Standards/ best practices developed	- Number of dissemination events (e.g. workshops, presenting at conferences, with detail on the number of each type of event and who attended/engaged in the events) - Standard developed - Publications and dissemination events organised	- Benefit Template: Knowledge Dissemination section - Survey/focus groups with MNOs and other network providers (questions possibly incorporated into Benefits Tracker)	- Information collected each quarter through Benefit Template, and towards the end of the programme through surveys (~ April/May 2025) - Output to be realised during the life of programme
Knowledge sharing / lessons learned for organisations outside intervention area	- Knowledge shared outside the intervention area through UKTIN and other communication/dissemination activities	- Evidence uploaded to UKTIN website - Workshops/ Communication campaigns/Dissemination events - Public documents detailing benefits of use cases - Standards/ best practices developed	- Number of disseminations events (e.g. workshops, conferences, documents) and publications by UKTIN	- Interviews with the UKTIN Comms team/DIST officials	- Information collected towards the end of the programme (~ April/May 2025) - Output to be realised during the life of programme
Knowledge sharing / lessons learned for the delivery of the programme for DSIT	DSIT will review lessons learned through the course of, and at the end of, the 5GIR programme and assess the efficiency of the delivery of the programme	- Public documents (evaluation)	- Documentation of lessons learned each quarter	- Benefit Template: Lessons (quarterly) section	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus

					groups/interviews (~ April/May 2025) - Output to be realised during the life of programme
Ecosystem development within intervention area	- Establishment of a 'structure' (e.g. stakeholder engagement programme/ framework/ working groups/ market engagement activities/ set-up of a task force / grant scheme) to develop an advanced wireless technology ecosystem within the intervention area and take forward current and future opportunities in the advanced wireless space	- Frameworks to support future adoption of advanced wireless networks and opportunities for sustainability	- Established working groups/task force/ grant schemes/ market activity engagement to develop wireless technology ecosystem in advance wireless technology	- Focus groups with 5GIR areas	- Information collected towards the end of the programme (~ April/May 2025) - Output to be realised during the life of programme
	- Promote the generation of privately funded projects within the community, for example, by hosting meetups, Workshops and helping to link demand with the relevant sector	- Workshops and various engagement activities - Pipeline for future investment	- Number of engagement activities held with the private sector stakeholders - Number of attendees	- Benefit Template: Knowledge Dissemination section	- Information collected each quarter through Benefit Template - Output to be realised during the life of programme

Table A1.2: Outcome indicators – 5GIR

Outcomes	Outcome metrics	Source	Expected timing of data collection and realisation of the outcomes
- Increased confidence among MNOs and other providers in the intervention LAs around the LAs commitment to advanced wireless technology certainty and its adoption in the intervention area	- Additional private funding generated by the project in advance wireless technology	- Benefit Template: Investment Stimulation section	- Information collected towards the end of the programme (~ April/May 2025) - Outcome to be realised during the life of the programme
- Improved understanding among local stakeholders in the intervention LAs of opportunities and benefits of advanced wireless technology adoption	- Data and evidence collected illustrating the benefit of use cases - Improved understanding of opportunities and benefits	- Benefit Template: Benefit Tracker section - Survey of use cases providers	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025) - Outcome to be realised during the life of the programme
- Set of stackable use cases to illustrate value of advanced wireless tech adoption	- Total use cases deployed per region	- Benefit Template: Benefits Tracker section	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025) - Outcome to be realised during the life of the programme
- Increased capability among organisations in the intervention LAs to use of advance wireless technology in intervention area - Improved connectivity	- Staff trained - Increased connectivity	- Benefit Template: Benefits Tracker section; Ofcom Connected Nations dataset - Benefit Template: Knowledge Dissemination section	- Information collected each quarter through Benefit Template; Ofcom data collected each September and released in December/January - Outcome to be realised during the life of the programme

- Short-terms employment - resources deployed for each project - GVA - as a result of additional spending to deliver projects - Use cases specific outcomes (e.g. productivity gains, welfare improvements, environmental benefits)	- Additional employment per use case deployed from each project - Spend associated with each use cases to deliver the project (including any alternative funding generated by the project). - Individual use cases impact	- Benefit Template: Benefits Tracker section - Benefit Template: Benefits Tracker section and applications/survey to use case and the providers	- Information collected each quarter through Benefit Template -Outcome to be realised during the life of the programme
- Stronger business cases for future investment in advanced wireless technology - Improved delivery of future use cases	- Individual use cases information	-Benefit Template: Benefit Tracker section/survey of use cases providers	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025) - Outcome to be realised during the life of the programme
- Increased awareness by organisations of benefits of adoption of 5G to organisations - Improved understanding of challenges and opportunities for further programmes across the region and sector - Stronger business cases for investment as a result of 'successful' delivery of use cases	- Survey of MNOs, other network providers, and use cases providers - Alternative funding generated by the project - Number of networks continuing operation at the end of the programme (to be reported at the Last Benefit Template collection)	- Survey of use cases providers - Benefit Template: Investment stimulation section - Benefit Template: Benefit Tracker section	- Information collected each quarter through Benefit Template, and towards the end of the programme through focus groups/interviews (~ April/May 2025) - Outcome to be part-realised during the life of the programme

- Reduction in market barriers to entry/adopt 5G/advanced wireless technologies as a result of the improved awareness of opportunities/challenges - Increased commercial investment by MNOs and other operators in set-up/deployment of networks/technology as a result of the successful delivery of use cases and increased interest/demand by organisations in adoption of advanced wireless technology - Increased market demand (and subsequent commercial investment) by organisations/businesses for adoption of 5G/advanced wireless technology as a result of 'successful' delivery of use cases within and outside intervention area			
- Outcomes identified for the intervention LAs realised more widely, among non-intervention areas	- Adoption of use cases in LAs outside of the intervention areas - Additional commercial investment in LAs outside of the intervention areas	- Interviews with UKTIN Comms team/DSIT officials - Primary research/subject matter experts/industry press	- Information towards the end of the programme (~ April/May 2025) - Outcome to be part-realised during the life of the programme
- Improved understanding of advantages/disadvantages of delivering programmes in the way 5GIR was delivered - Improved outcomes for LAs in delivery of programme - Improved efficiency in delivery of DSIT programmes	- Decentralised delivery is more effective and efficient to deliver DSIT programmes by LAs and DSIT officials	- Interview with 5GIR areas and DSIT officials	- Information collected at the end of the programme - Outcome to be realised during the life of the programme

- Continuation of services/ connectivity/ networks after funding ends - Further collaboration between organisations and stakeholders that were brought together thanks to the delivery of the use cases - Lasting commercial relationships developed - Industry innovation as a result of collaboration/knowledge sharing between organisations/stakeholders - Commercial investment in advanced wireless technologies	- Number of spin-offs generated - Number of patent application granted - Number of networks continuing operation at the end of the programme. (To only be reported on in Last Benefit Template collection) - Additional commercial investment	- Benefit Template: Knowledge Dissemination section - Benefit Template Benefit: Tracker section - Benefit Template: Investment Stimulation section	- Information collected each quarter through Benefit Template - Outcome to be part-realised during the life of the programme

Table A1.3: Impacts indicators – 5GIR

Impacts	Impact metrics	source	Expected timing of data collection and realisation of the indicators
- Foster 5G ecosystem, including increased collaboration among partners and adoption of advanced wireless technology - Economic growth - Accelerate 5G commercial investment	- Additional GVA generated in the 5GIR related sectors - Additional inward investment in the regions in related sectors	- ONS Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions[43]	- ONS Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions dataset is released annually, as described in Table 17

[43] ONS (2023), Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions (Subregional productivity: labour productivity indices by UK ITL2 and ITL3 subregions - Office for National Statistics).

			- Expected initial impact realised after the end of the programme
- Wider societal benefits	- Use case specific impacts (e.g. welfare impacts, environmental externalities etc.)	- ONS Subnational indicators dataset[44]	- Relevant variables of this ONS dataset are released as described in Table 17 - Expected initial impact realised after the end of the programme
- More efficient delivery of HMG programmes	- Improved delivery of HMG programmes	- Focus groups/interviews with DSIT officials and 5 GIR areas	- Information collected towards the end of the programme (April/May 2025) - Expected initial impact realised by the end of programme

[44] ONS (2023), Subnational indicator dataset (Subnational indicators dataset - Office for National Statistics (ons.gov.uk)).

Appendix 2: Network and use case stakeholder survey results

This appendix sets out the findings from the two surveys conducted for this evaluation: the network provider survey and the use case stakeholder survey. The appendix sets out the findings to similar questions in the two surveys.

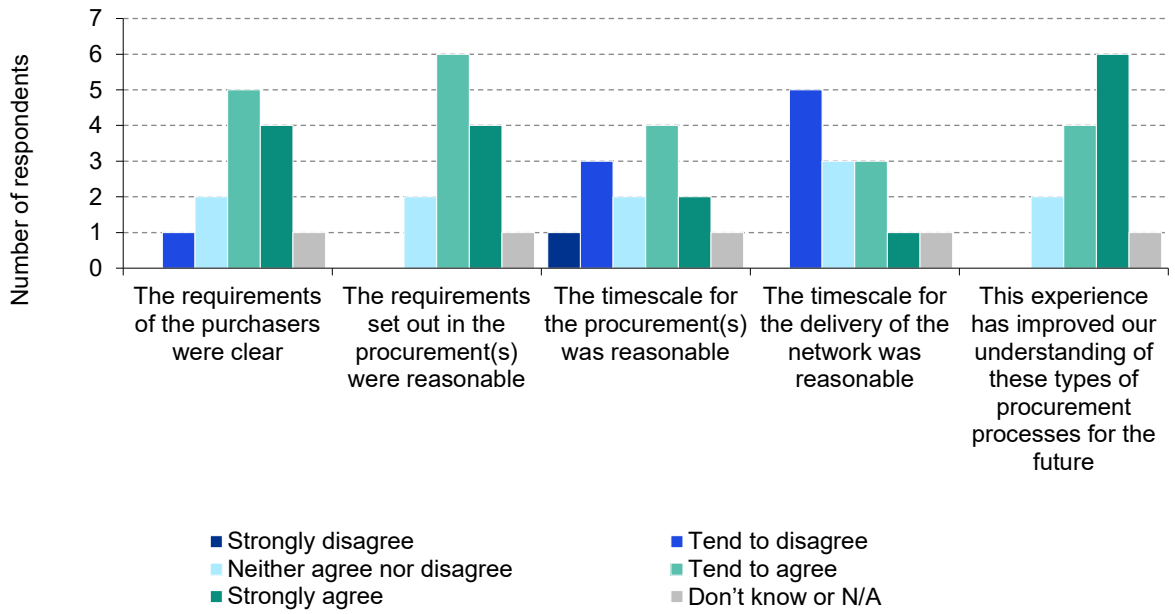
It should be noted that the use case stakeholder survey includes providers of use case technology and/or services to 5GIR projects as well as procurers and users of the use cases. In the surveys respondents were invited to answer the questions as best they could from their respective points of view (and including adding free text responses where that might help provide more context). The results are presented here in aggregate form; use case stakeholders as a whole. More detailed analysis of the survey results (splitting responses by use case suppliers and use case buyers or users) was conducted but did not show any material difference in the main findings drawn from the use case stakeholder survey as presented below. Whilst the exact proportion agreeing or disagreeing with the various statements covered in the survey differed slightly as between the two groups the responses for all questions were consistent across the two groups and of similar magnitudes.

A2.1 Survey findings

A2.1.1 Stakeholders' experience of procurement

Figure A2.1 below shows that at least nine out of the 13 network providers that responded to the survey tended to agree or strongly agreed that the requirements set out in 5GIR procurements were both clear and reasonable. Views on the timescales allowed for the procurement itself and the subsequent delivery of network connectivity services were less positive. Six network providers that responded to the survey tended to agree or strongly agreed that the timescale for the procurement itself was reasonable but only four tended to agree or strongly agreed that the timescale for delivery of the network services was reasonable. Ten out of the 13 network providers that responded to the survey tended to agree or strongly agreed that the experience improved their understanding of procurement processes for the future.

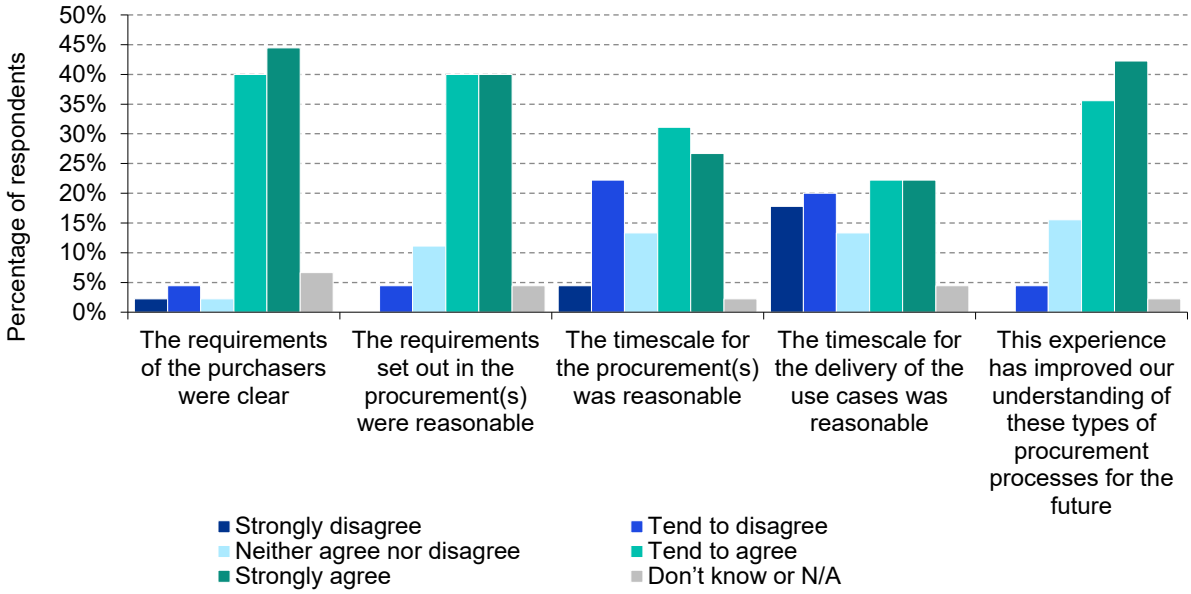
Figure A2.1: Network providers views on their experience of 5GIR procurement (n=13)



Source: KPMG network provider survey

As shown in Figure A2.2 below, the vast majority of use case stakeholders that responded to the survey tended to agree or strongly agreed that the requirements set out in procurements were both clear and reasonable. Views on the timescales provided for both the procurement and the subsequent delivery of use cases were more mixed. Just over one quarter of use case stakeholders that responded to the survey tended to disagree or strongly disagreed that the timescale for the procurement were reasonable; just over a third tended to disagree or strongly disagreed that the timescales for delivery were reasonable. Just over three quarters of use case stakeholders that responded to the survey tended to agree or strongly agreed that the experience had improved their understanding of procurement processes for the future.

Figure A2.2: Use case stakeholders views on their experience of 5GIR procurement (n=45)

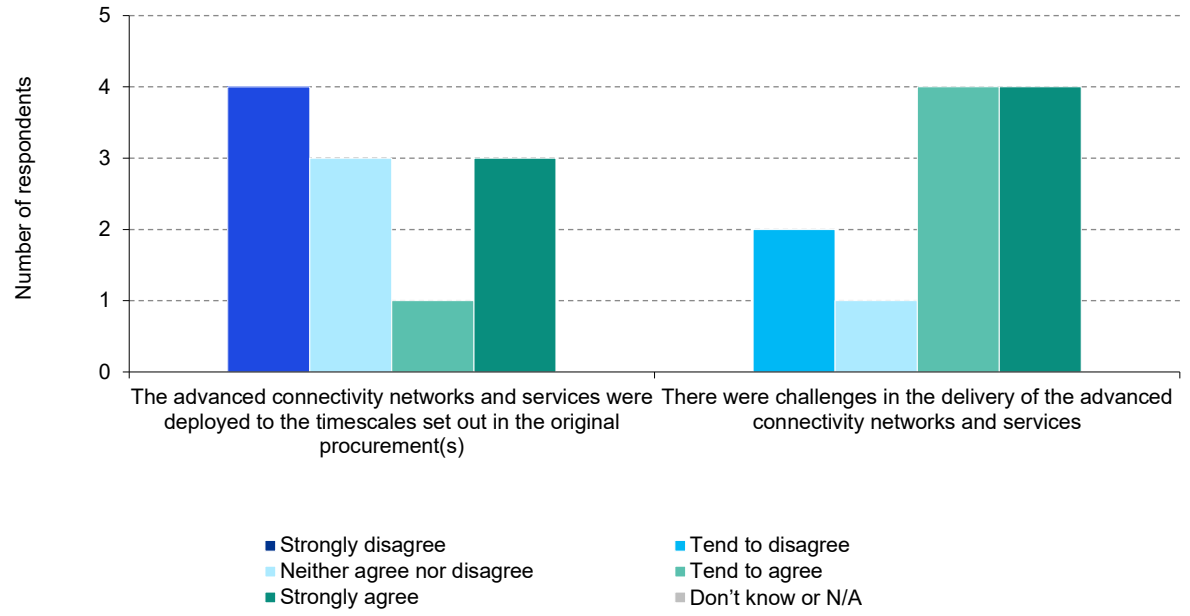


Source: KPMG use case stakeholder survey

A2.1.2 Stakeholders' views of delivery

Figure A2.3 below shows that four out of the 11 network providers that responded to this question in the survey tended to agree or strongly agreed that the advanced connectivity networks and services were deployed to the timelines set out in the original procurement. Eight network providers tended to agree or strongly agreed that they had experienced challenges in the delivery of advanced connectivity networks and services.

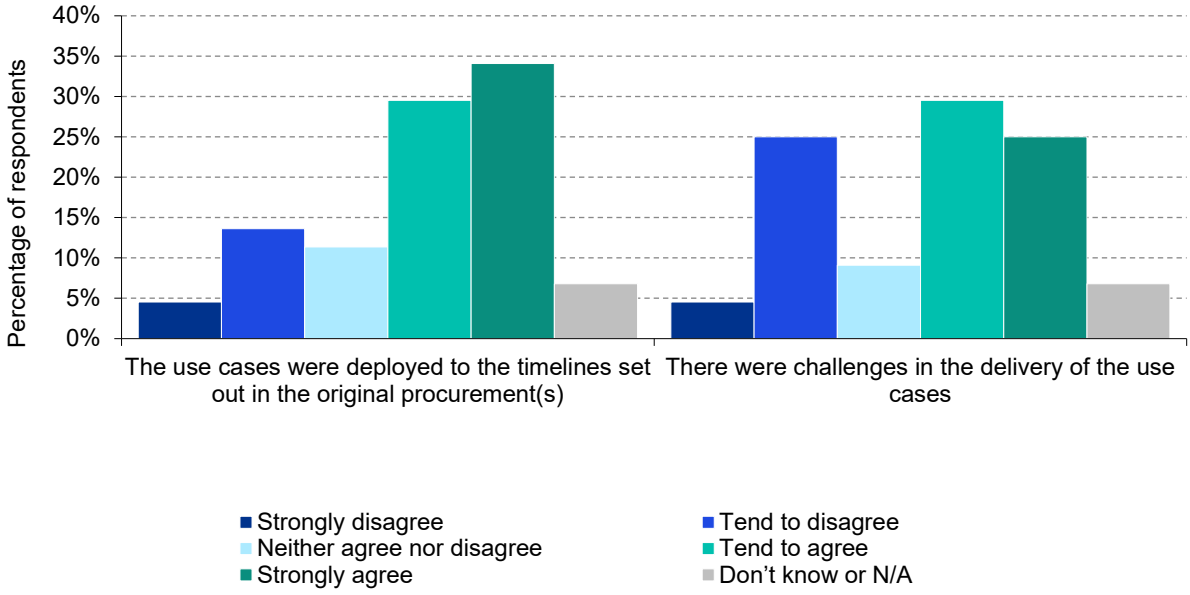
Figure A2.3: Network providers views of 5GIR advanced connectivity networks and services delivery (n=11)



Source: KPMG network provider survey

Figure A2.4 below illustrates that whilst almost two-thirds of use case stakeholders that responded to the survey tended to agree or strongly agreed that use cases were deployed to the timelines set out in the original procurement, over half tended to agree or strongly agreed that they had experienced challenges in the delivery of use cases.

Figure A2.4: Use case stakeholders views of 5GIR use case delivery (n=44)



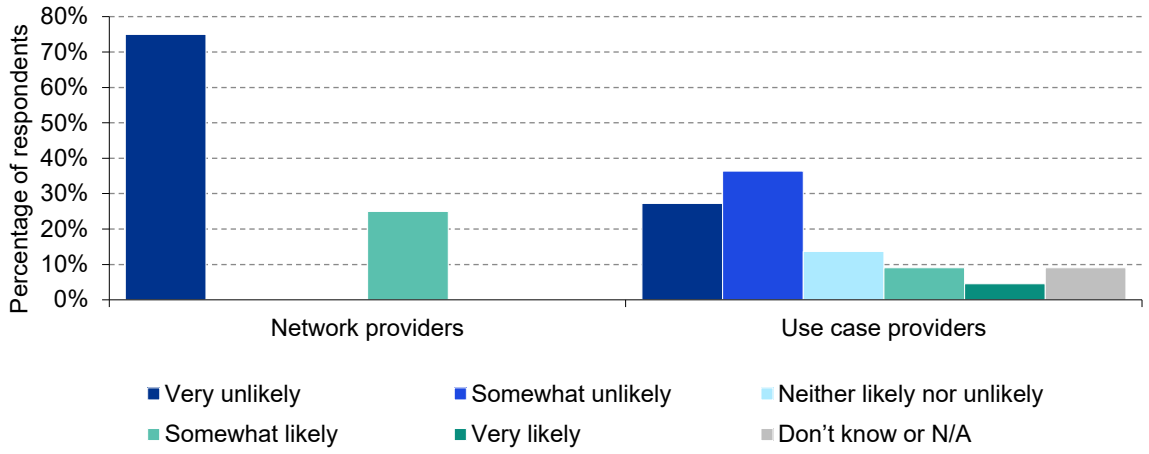
Source: KPMG use case stakeholder survey

A2.1.3 Stakeholders' views of the impact of DSIT funding

As shown in Figure A2.5 below, of the four 5GIR network providers that responded to the survey and said they were not already active in the 5GIR area pre-intervention, three said that without the DSIT funding it was somewhat or very unlikely that they would have invested in advanced connectivity networks and services in the 5GIR area.

Similarly, almost two-thirds of use case stakeholders that responded to the survey felt that without the DSIT funding they were somewhat or very unlikely to have invested in the use cases in the 5GIR area.

Figure A2.5: Network and use case stakeholders views on investment in the absence of DSIT funding (n=4 for network providers; n=44 for use case stakeholders)

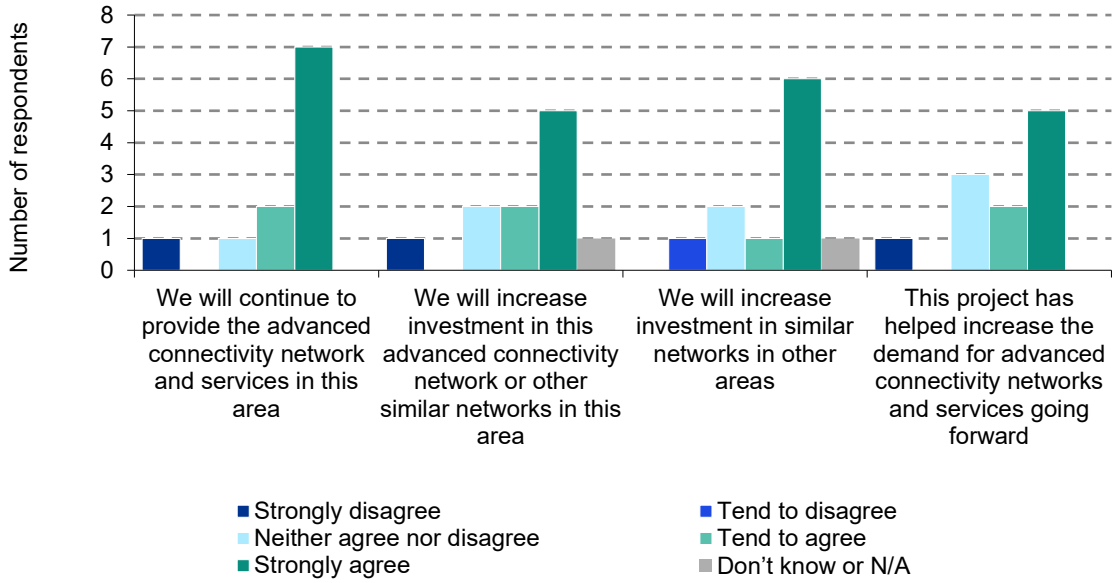


Source: KPMG analysis of the 5GIR network provider and 5GIR use case stakeholder surveys

A2.1.4 Stakeholders' views on funding, sustainability and investment intentions

Figure A2.6 shows that nine out of the 11 network providers that responded to this question in the survey tended to agree or strongly agreed that they will continue to provide their advanced connectivity networks and services in the 5GIR area beyond the end of the project. Seven network providers that responded to this survey question said that they tended to agree or strongly agreed that the project had helped increase the demand for advanced connectivity networks and services going forward and tended to agree or strongly agreed that they would increase investment in the network in the 5GIR area or similar networks elsewhere.

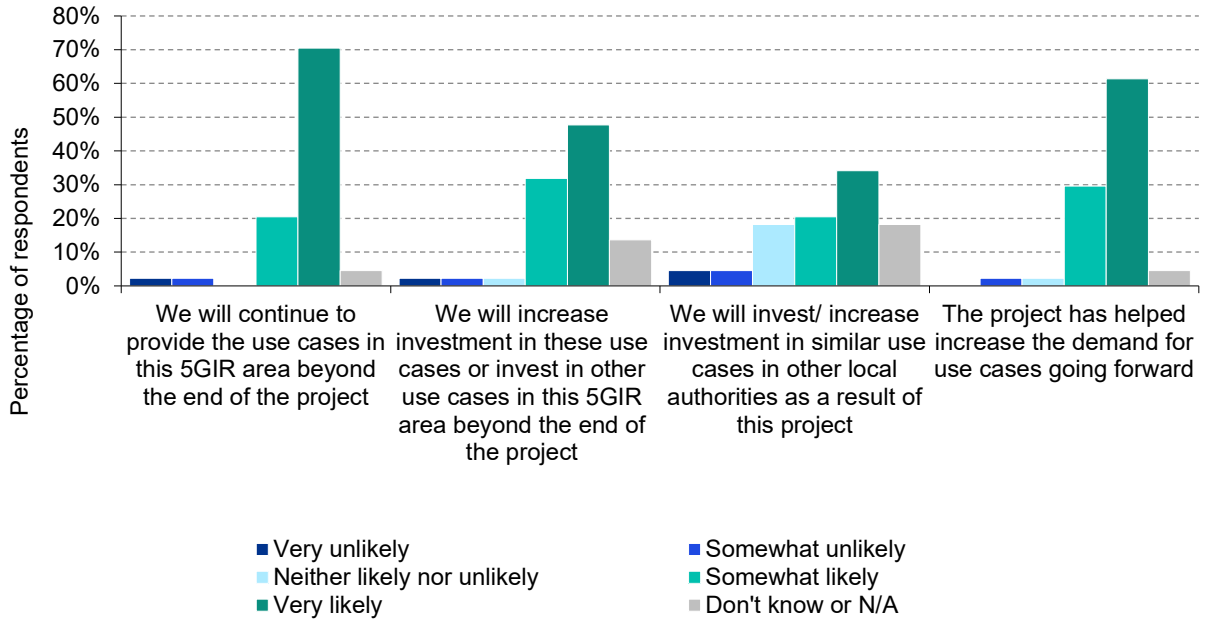
Figure A2.6: Network providers views on funding, sustainability and investment intentions (n=11)



Source: KPMG network provider survey

Figure A2.7 shows that 90 per cent of use case stakeholders that responded to the survey think it somewhat or very likely that they will continue to provide their use case in the 5GIR area beyond the end of the project (i.e. March 2026). A similar percentage said that the project had helped increase the demand for use cases going forward. Eighty per cent of respondents said that they were somewhat or very likely to increase investment in use cases in the 5GIR area beyond the end of the project. A lower percentage of respondents, 55 per cent, said that they were somewhat or very likely to increase investment in similar use cases in other LAs as a result of the project.

Figure A2.7: Use case stakeholders views on funding, sustainability and investment intentions (n=44)



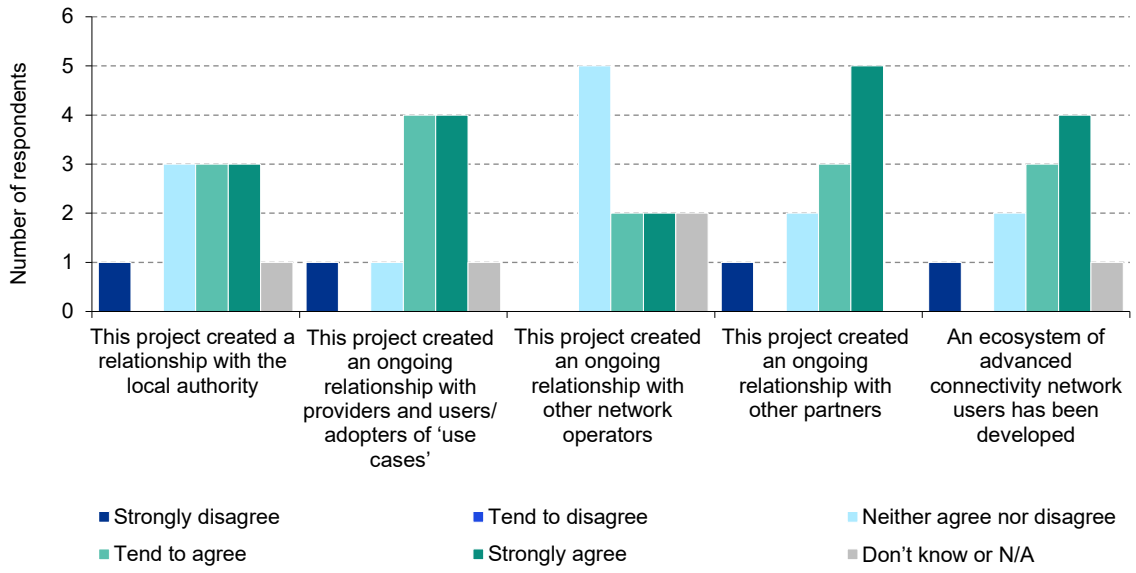
Source: KPMG use case stakeholder survey

A2.1.5 Stakeholders' views on partnerships developed through the project

Figure A2.8 shows that eight out of the 11 network providers that responded to this question in the survey tended to agree or strongly agreed that the 5GIR intervention had created an on-going partnership with other partners that will facilitate future engagement/activity. Looking at particular partnerships created, six network providers that responded to the survey tended to agree or strongly agreed that the project had created a relationship with the LA that would facilitate future engagement/activities; eight network providers tended to agree or strongly agreed that a relationship had been created with use case stakeholders; and four network providers tended to agree or strongly agreed that a relationship had been created with other network operators.

Similarly, seven out of the 11 network providers that responded to the question in the survey tended to agree or strongly agreed that an ecosystem of advanced connectivity network users had been developed in the area as a result of the 5GIR intervention.

Figure A2.8: Network providers views of on-going relationships as a result of the 5GIR programme (n=11)

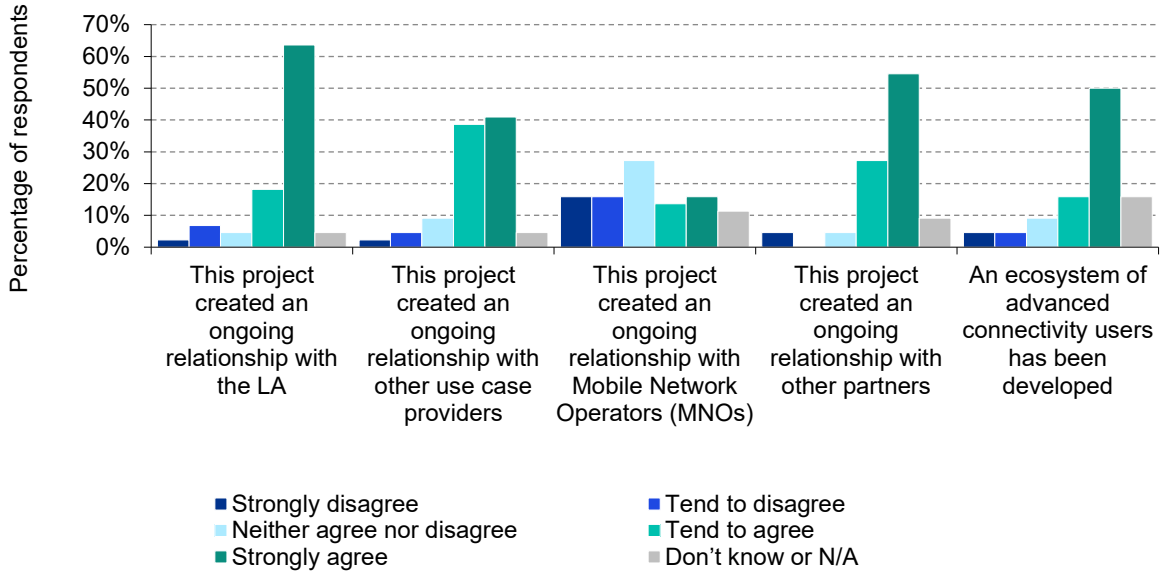


Source: KPMG network provider survey

Similarly, among use case stakeholders, Figure A2.9 shows that over four-fifths of use case stakeholders that responded to the survey said that they tended to agree or strongly agreed that the 5GIR project had created an on-going partnership with other partners that will facilitate future engagement/activity. Looking at particular partnerships created, over 80 per cent of use case stakeholders that responded to the survey tended to agree or strongly agreed that the project had created a relationship with the LA that would facilitate future engagement/activities; 80 per cent tended to agree or strongly agreed that a relationship had been created with other use case stakeholders; and 30 per cent tended to agree or strongly agreed that a relationship had been created with network operators.

Finally, two-thirds of use case stakeholders that responded to the question in the survey tended to agree or strongly agreed that an ecosystem of advanced connectivity users had been developed in the area as a result of the 5GIR intervention.

Figure A2.9: Use case stakeholders views of on-going relationships as a result of the 5GIR programme (n=44)



Source: KPMG use case stakeholder survey

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